

Exhibit E

(previously filed as Dkt. 660-5)

**UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF VIRGINIA
ALEXANDRIA DIVISION**

United States of America, *et al.*,

Plaintiffs,

v.

Google LLC,

Defendant.

Case No. 1:23-cv-00108-LMB-JFA

Hon. Leonie H. M. Brinkema

EXPERT REBUTTAL REPORT OF ROBIN S. LEE, PHD

February 13, 2024

competitive constraint to prevent Google (or a hypothetical monopolist) from exercising significant market power over publisher ad servers, ad exchanges, or advertiser ad networks for open-web display advertising. Dr. Israel has failed to demonstrate that this is the case for any product excluded from the relevant markets defined in my initial report.

IV.A.2. Assessments of substitution among ad tech products at prevailing prices can succumb to the “Cellophane Fallacy”

- (72) Dr. Israel and I agree that market definition focuses on customer substitution.¹¹⁶ However, as is commonly understood by economists, assessing substitutability between products for the purposes of market definition when it is possible that prevailing prices already exceed competitive prices risks overstating the significance of more distant substitutes.¹¹⁷ This is because at elevated prices, customers would more likely substitute to alternatives that would not otherwise have been close substitutes at more competitive prices. Ignoring this point is commonly known as the “Cellophane Fallacy,” and can lead to markets that are misleadingly broad for the purposes of evaluating market power.¹¹⁸
- (73) Dr. Israel argues that the Cellophane Fallacy “does not eliminate the need to assess evidence of customer substitution as part of the market definition inquiry in this case.”¹¹⁹ Although customer substitution is important to consider, for the purposes of the HMT, it is substitution at competitive price levels that informs whether a hypothetical monopolist can exercise market power. When there is valid concern (and direct evidence) that prices for products have already been subject to the exercise of significant market power, there are categories of evidence other than substitution patterns at prevailing prices that inform whether a market contains enough close substitutes to pass the HMT.¹²⁰

¹¹⁶ Lee Initial Report, ¶ 247; Israel Report, ¶ 153 (“Economists assess reasonable interchangeability from the perspective of the customer(s) (here advertisers and publishers) and thus the market definition exercise typically depends on demand-side substitution (i.e., substitution across ad tech tools by advertisers and publishers in response to relative changes in price and/or quality).”).

¹¹⁷ Lee Initial Report, ¶ 251 (“[C]ontrast, for monopolization claims, the HMT considers customer substitution patterns at the benchmark of competitive prices. This is because an important concern is that *prevailing prices may already reflect the exercise of substantial market power by the alleged monopolist*. At such elevated prices, consumers would likely substitute away from the alleged monopolist’s products to alternatives were the alleged monopolist to impose a further price increase—even if those alternatives are not close substitutes for the alleged monopolist’s products *were the monopolist’s products priced more competitively*. When there is a concern that prevailing prices (or product qualities) depart significantly from those that would otherwise obtain in a more competitive environment, relying on observed customer substitution patterns at existing price or quality levels risks overstating the competitive significance of more distant substitutes that customers only turn to after a set of products has already been monopolized.”). (emphasis in original).

¹¹⁸ Lee Initial Report, n. 340.

¹¹⁹ Israel Report, ¶ 167.

¹²⁰ Lee Initial Report, ¶¶ 253–254.

- (74) Nonetheless, Dr. Israel attempts to dismiss these concerns. First, he asserts that I have failed to establish that “prevailing prices exceed competitive levels” for the products at issue in this matter.¹²¹ Given substantial evidence that Google has indeed levied supracompetitive prices on its ad tech products for years,¹²² Dr. Israel does not support this claim (see further discussion in Section V).
- (75) Dr. Israel also states that “[a]dvertisers seek to attract the attention of users wherever it can be found. There is no reason to think that this objective holds only at ‘high’ prices for open web display advertising.”^{123,124} This statement seemingly (and incorrectly) assumes away the Cellophane Fallacy issue by implying that because buyers’ general objectives do not change at different price levels, their substitution patterns between products do not change at different price levels. This error in this logic can be seen by considering the *DuPont* case in which the “Cellophane Fallacy” terminology originated.¹²⁵ In that case, the Court found that buyers viewed non-cellophane wrapping materials as close substitutes at prevailing, supracompetitive prices, which would likely not have been the case at more competitive prices.¹²⁶ Though their presumed objective of wrapping their products the most efficient way possible would not change with relative prices, the choice of a particular wrapping material would. Similarly, even though advertisers generally try to attract the attention of users regardless of the relative prices of different forms of advertising, their choices among different forms of advertising tools—and thus observed substitution patterns—are impacted by their relative prices.
- (76) Hence, Dr. Israel’s reliance on documented or estimated customer substitution patterns at prevailing price levels overstates the extent to which customers would substitute among products at more competitive levels.¹²⁷

¹²¹ Israel Report, ¶ 167 (“First, as I explain in Sections VIII.A.2 and Section IX.B.1 below [*sic*] neither Prof. Lee nor Plaintiff’s other experts have established that the challenged conduct elevated the fees associated with the full ad tech stack and thus have not established that ‘prevailing prices exceed competitive levels.’”). Note that Dr. Israel mistakenly believes that market definition requires establishing that “the challenged conduct elevated the fees”, or that “substitution absent the challenged conduct” is what is relevant for market definition. Israel Report, ¶167. This is incorrect as well: the benchmark set of prices for the purposes of market definition and performing the HMT are *competitive* prices, which *do not* depend on the conduct being scrutinized.

¹²² See Lee Initial Report, § V.

¹²³ Israel Report, ¶ 168 (“Advertisers seek to attract the attention of users wherever it can be found. There is no reason to think that this objective holds only at ‘high’ prices for open web display advertising.”).

¹²⁴ In this statement and throughout his report, Dr. Israel focuses on advertiser substitution but not publisher substitution, the latter of which can be insufficiently elastic to constrain the market power of a hypothetical monopolist (or Google). See discussion in Section IV.A.3.

¹²⁵ *United States v. E.I. du Pont de Nemours & Co.*, 351 U.S. 377 (1956).

¹²⁶ Gene C. Schaerr, “The Cellophane Fallacy and the Justice Department’s Guidelines for Horizontal Mergers,” *Yale Law Journal* 94 (1985), n. 52 (“Recall that the prevailing price for cellophane was arguably supra-competitive, and that at that price consumers regarded a number of other flexible wrapping materials as good substitutes for cellophane...If consumers regarded these other products as good substitutes for cellophane at the prevailing, supra-competitive price, then they probably would not have regarded them as good substitutes if cellophane were priced competitively.”).

¹²⁷ See, e.g., Israel Report, ¶¶ 235 (“Prof. Simonson’s survey also demonstrates that advertisers and the agencies that work on their behalf would shift spend to walled gardens in response to an increase in the cost of display advertising.”) and 287 (“In particular, if Google were to raise the price of its ad exchange, alternative advertising channels would become relatively more attractive.”).

I may be in some sense “multihoming” across types of tools—but this is not because they are necessarily substitutes. Even though on some jobs they may be (imperfectly) substitutable, I have them both in my toolbox because each is well-suited to a particular type of job. To take another example, many people own both a smartphone and a television—that is, they “multihome” on devices with digital screens. But although one can watch a movie on both devices (and hence they are imperfect substitutes for some tasks), this does not mean that a hypothetical monopolist of televisions would necessarily be constrained from charging higher than competitive prices by customer substitution to smartphones.¹³¹

- (82) Thus, multihoming itself does not alone provide conclusive evidence of substitution between products.¹³² One must also consider the reason for the multihoming before attempting to reach such conclusions. If multihoming occurs because one needs multiple tools that serve different functions, then multihoming can be consistent with a *lack* of substitutability.
- (83) An example of this can be found, for example, in Dr. Israel’s Figure 13, which shows that 22–31% of survey respondents used “four or more” ad buying tools. Such ad buying tools may include advertiser ad networks and DSPs, tools facilitating different ad formats (video, social media), and integrated ad tech tools used to purchase “owned and operated” publisher inventory. Hence, without further context, this result merely indicates that some advertisers have many tools in their toolbox, not that those tools are necessarily substitutes.¹³³
- (84) In summary, multihoming is not “binary”—for understanding whether observed multihoming behavior across products is indicative of those products being substitutes, it is important to also consider:
- The extent to which products provide different functionalities to customers. For example, as I discussed in my initial report and below in Section IV.E, some large advertisers use both Google

¹³¹ As yet another example, I may buy a bag of potato chips in a given week from both a grocery store and a gas station—thus, in a sense, “multihoming” across food stores. But if I suddenly could not access a grocery store, my ability to shift my food spending to gas stations will be limited.

¹³² I discussed this issue in my initial report with respect to different forms of digital advertising Lee Initial Report, ¶¶ 285–289. In my initial report, I also noted that increased multihoming and switching costs can damage competition and efficiency because it makes “more costly for customers to move away from a given firm’s products or to use rivals’ products in addition” in the event that a firm attempts to exercise market power (Lee Initial Report, ¶ 190). Note that in this discussion, customers may choose to multihome *because they are substituting* to alternative products when faced with higher prices. However, this discussion does not mean that *all* observed instances of multihoming arise from substitution.

¹³³ I also understand that Prof. Hoyer has identified flaws in Prof. Simonson’s survey upon which Dr. Israel relies (*see generally* Hoyer Report, § III). With respect to this question, I understand Prof. Hoyer concludes that what Dr. Israel describes as “multi-homing” may include respondents who tested and rejected a particular tool or for whom tools are viewed as complementary rather than as alternatives. *See* Hoyer Report, § III.E.

not mean tools that do not transact open-web display advertising must be contained within the same relevant antitrust market as publisher ad servers, ad exchanges, or advertiser ad networks that do.

- (88) For instance, the rise of air travel displaced some amount of train travel, but today airline markets are routinely analyzed excluding trains or other forms of transportation because they serve distinct purposes, even though some consumers may use both at different times. Similarly, the displacement of “feature phones” and landline phones by smartphones does not mean that a smartphone market alone would not pass an HMT.

IV.A.6. Dr. Israel fails to rebut the role of direct evidence of market power for establishing relevant markets

- (89) In this case, Google has exercised significant market power in each of the relevant product markets that I discussed in my initial report—publisher ad servers, ad exchanges, and advertiser ad networks for open-web display advertising—without causing enough substitution to alternative products to make such an exercise unprofitable. Direct evidence of this behavior indicates that these are relevant product markets: because Google was able to profitably exercise market power over these products despite the possibility of substitution to alternative products, a hypothetical monopolist that controlled Google’s products as well as rival products in the market would also find it profitable to do so.¹³⁸
- (90) I discussed this direct evidence in my initial report,¹³⁹ and also provide more discussion—including a summary of evidence that Dr. Israel fails or acknowledge or rebut—in Section V below.
- (91) Direct evidence of Google’s substantial market power within the relevant markets leads to two additional implications. First, it indicates that Google can charge quality-adjusted prices significantly above competitive levels, even without precisely specifying what those competitive levels are. This is useful because competitive prices are typically difficult to ascertain in markets that have already been monopolized, or subject to the exercise of significant market power by market participants, for an extended period of time. Second, it also demonstrates that potential constraints imposed by indirect network effects do not prevent Google—nor a hypothetical monopolist within each market—from charging quality-adjusted prices above competitive levels.¹⁴⁰
- (92) In response to the above, Dr. Israel asserts that “even taking ‘direct’ evidence as given, such evidence establishes at most that there is some market power in some relevant market. It does not establish the existence of monopoly power, nor does it support the existence of a specific relevant market.”¹⁴¹ Dr.

¹³⁸ Lee Initial Report, ¶ 254.

¹³⁹ Lee Initial Report, § V.

¹⁴⁰ Thus, Dr. Israel is incorrect in claiming that my discussion of the product markets at issue do not account for two-sidedness and network effects. *See also*, Section III and Lee Initial Report, § III.B and n. 239.

¹⁴¹ Israel Report, ¶ 160. I address Dr. Israel’s failure to support his claim that I do not “establish that Google possesses monopoly power in any relevant market” below in Section V.

Israel is incorrect. First, for the purposes of market definition, it is sufficient to show that a hypothetical monopolist that owned all products would likely possess enough market power to profitably implement a SSNIP; establishing that only one participant possesses monopoly power, which is a higher bar and generally associated with substantial and sustained market power protected by significant barriers to entry, is not a necessary criterion for defining a relevant product market.¹⁴² Second, the direct evidence I provide does indicate that Google possesses substantial market and sustained market power in the relevant markets at issue (see Section V below), and is thus more than sufficient to satisfy the HMT.

IV.B. Open-web display advertising is a distinct and important form of advertising for publishers and advertisers, indicating that customer substitution would not constrain the exercise of market power in the relevant markets

- (93) In my initial report, I defined relevant product markets for *publisher ad servers*, *ad exchanges*, and *advertiser ad networks*.¹⁴³ Each of these product markets contain *ad tech tools* that are used to transact open-web display advertising. In these transactions, Google or other ad tech intermediaries are sellers, and there are two sets of distinct customers: advertisers (on the demand-side) and open-web publishers (on the supply-side).¹⁴⁴
- (94) I also discussed why—even though these relevant product markets do not contain the underlying display advertisements themselves, and are thus distinct from a hypothetical product market containing *open-web display advertising*—it is still nonetheless useful to examine how open-web display advertising is an important and distinct form of advertising from the perspective of advertisers and publishers.¹⁴⁵ Such analysis is informative because it clarifies why products that facilitate open-web display advertising transactions are particularly valued by open-web publishers and advertisers, and why products that do not facilitate such transactions are not close substitutes.¹⁴⁶
- (95) This distinction between the underlying display advertisements and the ad tech tools that facilitate their sale is important. One reason is that a firm that monopolizes parts of the ad tech stack can create a bottleneck and exercise market power even if there is a meaningful amount of digital advertising

¹⁴² Dr. Israel's own definition of the HMT used to define relevant markets makes no mention of monopoly power, but rather only that a hypothetical monopolist "that was the only present and future seller of the products in the candidate market... likely would impose at least a [SSNIP] on at least one product in the market, with the price increase evaluated relative to the competitive price that would obtain in the alleged market." (Israel Report, ¶ 157).

¹⁴³ Lee Initial Report, § IV.

¹⁴⁴ Lee Initial Report, ¶ 52.

¹⁴⁵ Lee Initial Report, § IV.B.

¹⁴⁶ Lee Initial Report, ¶ 245.

flowing through other channels. Focusing on types of advertising and not the underlying tools obscures the potential for competitive harm.

- (96) Another important reason that the distinction between display advertisements and the underlying ad tech tools matters is that the amount of substitutability between open-web display advertising and other forms of advertising that would be required to constrain a certain percentage increase in fees for an ad tech tool is different, and can be much greater, than the amount needed to constrain the same percentage increase in the price of open-web display advertising.
- (97) To see why, observe first that ad tech fees represent only a portion of the total cost of open-web display advertising. This implies that any percentage increase in ad tech fees results in a smaller percentage increase in the overall cost of open-web display advertising. As an example, consider of an advertiser who pays \$100 for an open-web display impression through an ad exchange which charges a 20% take rate (so that the publisher receives \$80). If the ad exchange increases its take rate by 5% (going from 20% to 21%), then even if the fee increase was completely borne by the advertiser so that publisher payout remained fixed at \$80, the advertiser's cost would only increase from \$100 to \$101.27 (all else equal), representing a 1.3% increase in the price of advertising.¹⁴⁷
- (98) Dr. Israel and Prof. Ghose largely ignore this key distinction and blur the lines between open-web display advertising and the tools used to transact it. They then draw incorrect conclusions regarding market definition.
- (99) For example, Dr. Israel concludes based on Prof. Simonson's survey that "advertisers would, in fact, shift substantial spend to social media as well as other digital advertising channels in response to a small but significant increase in the cost of programmatic open web display advertising."¹⁴⁸ Taking Dr. Israel's representation of Prof. Simonson's survey at face value, these same advertisers would nonetheless likely switch to a lesser degree in response to the same "small but significant increase" in percentage terms applied to the cost of *ad tech tools*, as the total cost increase would be smaller than contemplated by Prof. Simonson's survey (and would also likely be partially borne by publishers, and not just advertisers).
- (100) Similarly, Dr. Ghose claims "Plaintiffs' experts underappreciat[e] the extent to which advertising dollars shift between Plaintiffs' so-called 'open-web display advertising' and other types of display advertising"¹⁴⁹ and asserts that advertisers "switch advertising spending to maximize their ROI."¹⁵⁰

¹⁴⁷ $\$101.27 = \$80 \div (100\% - 21\%)$.

¹⁴⁸ Israel Report, ¶ 236 (emphasis added). See Section IV.B.2.b for discussion of Dr. Israel's reliance on these survey results.

¹⁴⁹ Ghose Report, ¶ 109.

¹⁵⁰ Ghose Report, ¶ 112.

He does not assess the extent to which advertising dollars shift between underlying ad tech tools, nor the extent to which ROI would be impacted by a price increase in those tools.

- (101) Neither Dr. Israel nor Dr. Ghose explain why a significant increase in ad tech fees—even if evaluated at existing levels¹⁵¹—would generate a large enough increase in the price of display advertising for there to be significant substitution to other forms of advertising.
- (102) To illustrate one reason this is unlikely, consider Figure 4, which contains Semrush’s calculation of the average CPM for various ad types and platforms.¹⁵² As I described above, an increase in ad exchange fees from 20% to 21% (representing a 5% increase *above already elevated levels*), *even if borne completely by advertisers*, would increase ad prices by 1.27%.¹⁵³ Based on the reported estimates in Figure 4, a 1.27% increase would raise the average CPM of desktop display ads from \$2.50 to \$2.53, still well below the cost of other forms of advertising. For example, the average CPM of social display ads in Figure 4 is \$5.50: \$3 (or 220%) more than desktop display. Dr. Israel and Dr. Ghose fail to explain why advertisers who chose to invest in desktop display at that price difference would shift a significant amount of their spend to social if the cost of desktop display was subject to a 3 cent CPM increase, such that social display ads still cost \$2.97 (or 217%) more than desktop display.¹⁵⁴

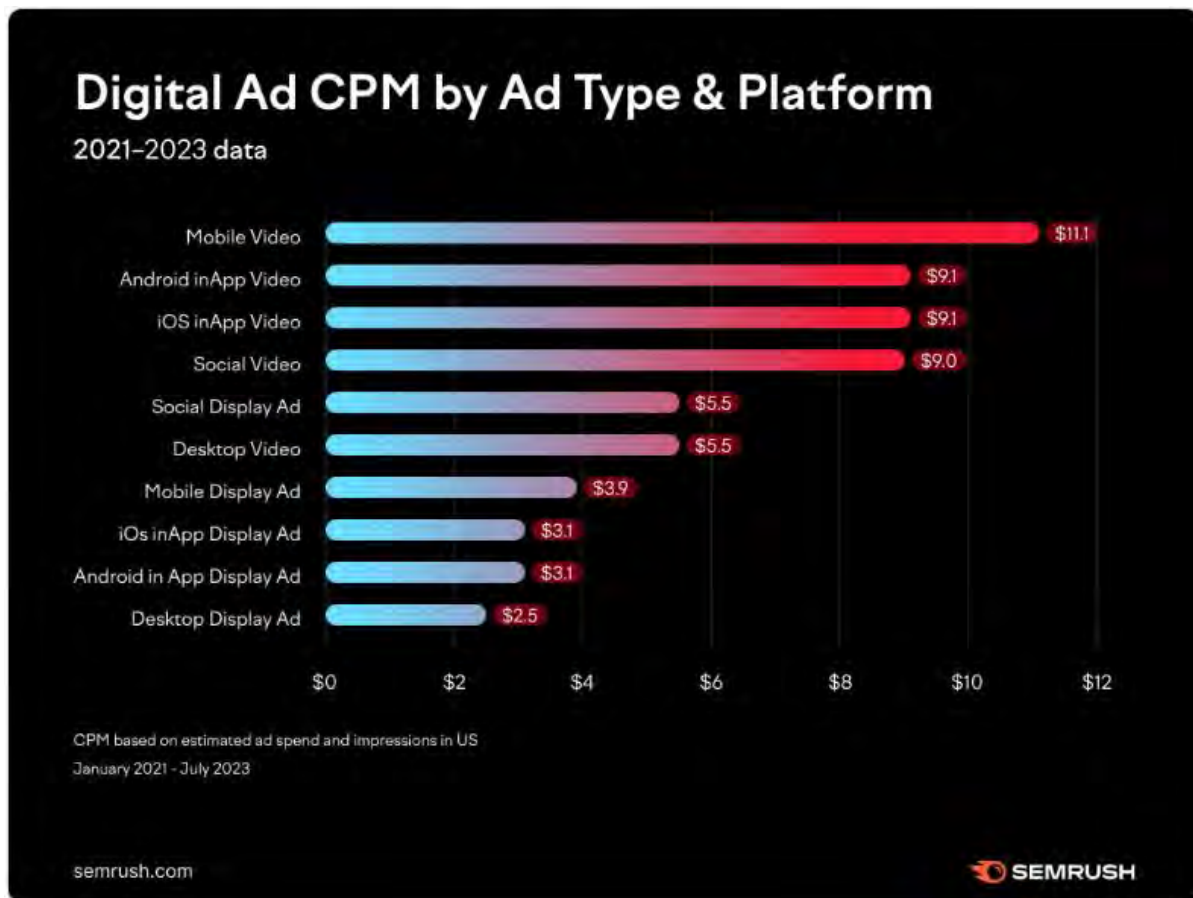
¹⁵¹ See Section IV.A.2 for discussion of why assessing an increase in ad tech fees at existing levels overstates the extent to which customers would substitute among products at competitive levels.

¹⁵² Semrush is “a leading online visibility management SaaS platform that enables businesses globally to run search engine optimization, pay-per-click, content, social media and competitive research campaigns and get measurable results from online marketing.” Business Wire, “Semrush Holdings, Inc. Announces Investor Conference Call to Review Fourth Quarter 2023 Financial Results,” Business Wire, March 5, 2023, <https://www.businesswire.com/news/home/20240206729468/en/Semrush-Holdings-Inc.-Announces-Investor-Conference-Call-to-Review-Fourth-Quarter-2023-Financial-Results>.

¹⁵³ As I explain in Sections III, IV.A.3, and IV.B.1, it is unlikely that an increase in ad exchange fees would be borne completely by advertisers given the lack of close substitutes on the publisher side. To the extent some portion of the increase in fees was borne by the publisher, the increase in ad prices would be lower than 1.27%.

¹⁵⁴ Dr. Israel argues that CPM “is the wrong metric to compare” because “advertisers care about the return on investment (ROI) that they earn on their advertising expenditure.” Israel Report, ¶ 180. However, CPM is an input into ROI and as I explain in Section IV.B.2.a, the documents that Prof. Ghose and Dr. Israel cite demonstrate that advertisers currently invest in multiple channels of advertising at different levels of ROI (and ROAS) such that a small price increase in ad tech tools, and the resulting smaller increase in CPM, would be unlikely to alter ROI by a sufficiently large amount to cause a significant amount of substitution to other channels. Additionally, Dr. Israel’s criticism of CPM is made from an advertiser’s perspective; however, CPM differences across advertising formats are consistent with those formats not being close substitutes from a *publisher’s* perspective (*see also* Section IV.B.3, n. 301).

Figure 4. Semrush analysis of “Digital Ad CPM by Ad Type & Platform”



Source: Luke Harsel, “Advertising Trends: CPM Benchmarks by Industry [Study],” *Semrush*, October 23, 2023, <https://www.semrush.com/blog/advertising-cpm-benchmarks-study/>

- (103) Google’s experts also erroneously claim that certain advertising types or forms of digital advertising are “excluded” from the product market.¹⁵⁵ However, this again misses the distinction between tools that transact advertising, and the underlying advertising itself. The relevant product markets contain those tools (publisher ad servers, ad exchanges, and advertiser ad networks) that transact open-web display advertising; such tools can also transact other forms of advertising, including direct deals, in-app display, and instream video ads. A product is only excluded if it cannot transact open-web display ads.¹⁵⁶
- (104) What Google’s experts appear to argue (albeit not very clearly), but fail to support, is that the relevant product markets need to be broadened to include products that might sell other forms of digital

¹⁵⁵ See discussion in Section IV.B.2.c.

¹⁵⁶ In my market share calculations, I restrict attention to open-web display transactions even if some of these products may transact other types of digital advertising.

advertising, even if those tools cannot transact open-web display ads. As I have discussed at length above and in my initial report, this is not true.

- (105) In the rest of this Section, I respond to points raised by Google’s experts regarding key distinctions between open-web display and other forms of digital advertising from both publishers’ and advertisers’ perspectives. The discussion at times will focus on the underlying display advertisements, even though (again) the products within the relevant markets are ad tech tools. I also describe why indirect transactions for open-web display advertising also provide distinct value to open-web publishers and advertisers. For the reasons discussed below, the criticisms raised by Google’s experts do not undermine the appropriateness or validity of the relevant product markets defined in my initial report.¹⁵⁷

IV.B.1. Publisher perspectives on open-web display advertising

- (106) Dr. Israel and Prof. Ghose focus on advertisers’ ability to reallocate spend away from open-web display advertising but say little (Dr. Israel) or nothing (Prof. Ghose) about open-web publishers’ abilities to substitute.
- (107) As I explained in Section III and IV.A.3 above and my initial report, focusing on advertiser substitution alone is not sufficient to demonstrate that a hypothetical monopolist could not exercise market power over a set of ad tech tools; it is necessary to also consider open-web publishers’ (limited) ability to substitute away from such tools.
- (108) In my opening report, I explained that publishers that monetize their web inventory via open-web display advertising have limited ability to substitute away to other forms of advertising or monetization in response to an exercise of market power by a hypothetical monopolist of certain ad tech products. Google’s experts do not address most of these limitations:
- Open-web publishers’ ability to shift advertising sales away from their web content is limited by the content they provide. For example, digital content providers cannot monetize impressions on their web properties by selling offline advertising.¹⁵⁸ Similarly, in-app ads cannot monetize a publisher’s web inventory.¹⁵⁹

¹⁵⁷ Dr. Israel claims that “open web display advertising” is an artificial term and that an OpenX study that I cite includes apps in the definition of open web. Importantly, markets are defined by economic principles, not industry studies. See Initial Report, n. 331. Nevertheless, the OpenX study is not inconsistent with my market definition where I excluded ads sold on O&O properties and ads sold using integrated ad tools. The OpenX study uses the term “open web” to label “website[s] or app[s] that are not owned by a major technology company (Facebook/Instagram, Amazon, YouTube).” Israel Report, ¶ 93, n. 29 (“In fact, as supposed support for the claim that ‘open web display advertising’ is distinct from advertising on apps, Plaintiffs’ expert Prof. Lee cites to a study that explicitly includes apps as part of ‘the open web,’ yet he still fails to recognize competition from apps in his market definitions.”).

¹⁵⁸ Lee Initial Report, ¶¶ 268–270.

¹⁵⁹ Lee Initial Report, ¶ 275.

- Instream video ads occupy different parts of a publishers' digital ad inventory (e.g., shown in a video player vs. shown in a "banner" ad at the top of the page).¹⁶⁰ Observed price differences are consistent with instream video and display ads not being close substitutes from a publisher's perspective—otherwise publishers would likely be expected to re-allocate their display advertising space to instream video to take advantage of the higher monetization rate.¹⁶¹
- Native ads are typically used in combination with display ads and occupy slots within, rather than above and around, publishers' content.¹⁶²
- Adopting a new monetization strategy for open-web content (e.g., subscriptions) instead of relying at all on display advertising would be costly and forgo a valuable source of revenue.¹⁶³
- For most open-web publishers, developing an integrated ad tech product would be costly and time consuming, require overcoming indirect network effects, and would limit access to advertiser demand.¹⁶⁴

(109) A 2020 presentation describing a survey of publishers relied upon by Dr. Israel corroborates that publishers view these categories as distinct. As shown below, the presentation identifies separate categories for "Display," "Video," "Native," "Social," "Advanced TV," and "All other media types" and notes that "[d]isplay continues to deliver the greatest share" (see Figure 5).¹⁶⁵ On another slide, the presentation distinguishes among platforms of "Desktop," "Mobile web," "Mobile in-app," "Advanced/CTV," and "All other platforms" with mobile web and desktop having the greatest shares (see Figure 6).¹⁶⁶

¹⁶⁰ Lee Initial Report, ¶ 272.

¹⁶¹ Lee Initial Report, ¶¶ 273–274.

¹⁶² Lee Initial Report, ¶ 276, noting also that there are quality issues (e.g., "clickbait ads") with certain forms of native ad that limit their use by publishers.

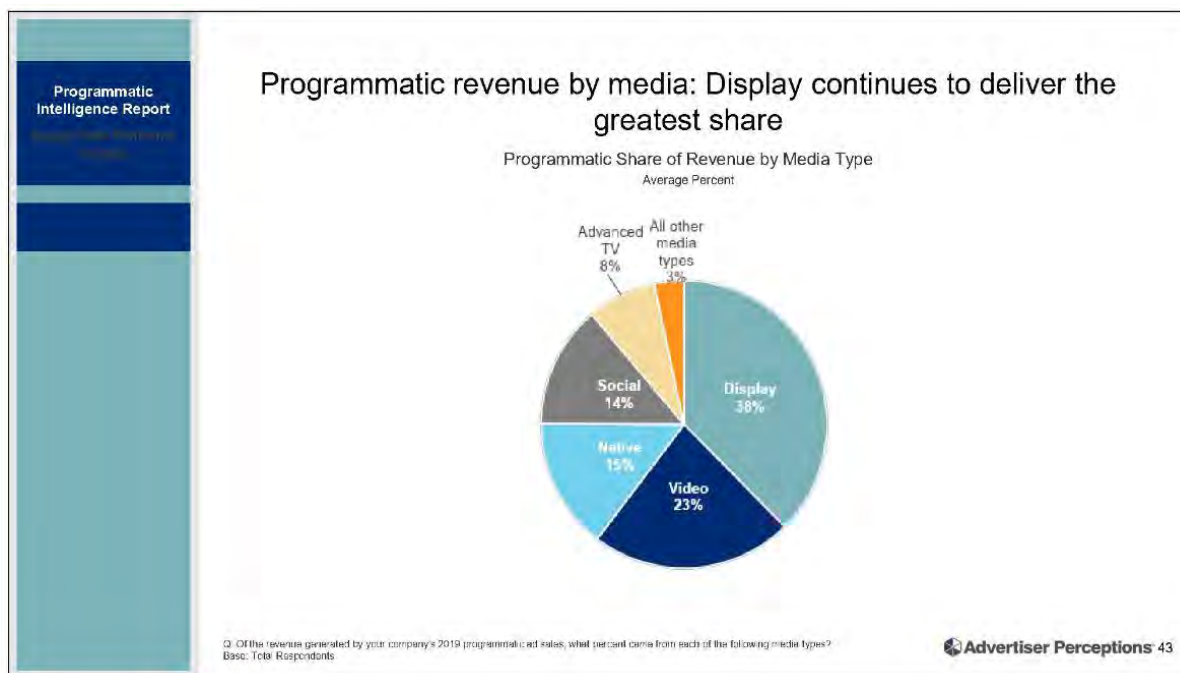
¹⁶³ Lee Initial Report, ¶ 266.

¹⁶⁴ Lee Initial Report, ¶ 281.

¹⁶⁵ GOOG-DOJ-AT-00608572, at -614 (2020).

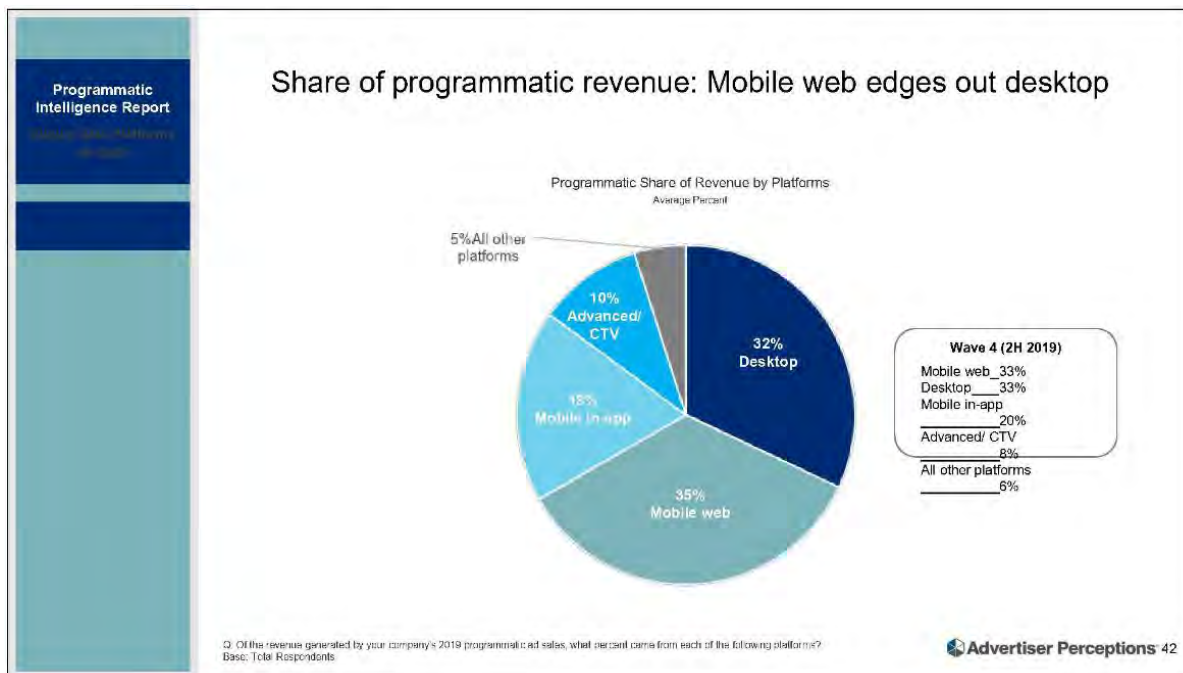
¹⁶⁶ GOOG-DOJ-AT-00608572, at -613 (2020).

Figure 5. Excerpt from Advertiser Perceptions "SSP Report"



Source: GOOG-DOJ-AT-00608572 at -614 (2020).

Figure 6. Excerpt from Advertiser Perceptions "SSP Report"



Source: GOOG-DOJ-AT-00608572 at -613 (2020).

- (110) Dr. Israel’s discussion of publishers substituting away from open-web display advertising is limited to speculation that “if one or more publisher ad servers focused on display advertising for open web publishers degrades...publishers have options that include focusing more attention on other formats for content, including app-based options.”¹⁶⁷ I address Dr. Israel’s hypothesized example of publisher ad server substitution in Section IV.C.1.
- (111) So while it is true that publishers may find it valuable to deploy multiple forms of digital advertising or transaction types within their “monetization toolbox,”¹⁶⁸ web display advertising has distinct features and value that make it an important form of advertising—i.e., it is an important tool in the toolbox. Hence, open-web publishers would be unlikely to substitute away to a sufficient degree from products that transact display advertising to constrain the exercise of market power by a hypothetical monopolist of publisher ad servers, ad exchanges, or advertiser ad networks.

IV.B.2. Advertiser perspectives on open-web display advertising

- (112) Dr. Israel asserts that my focus on open-web display advertising “excludes important alternative sources of advertising inventory to which advertisers could turn if the cost of open web display advertising increase” including “integrated advertising tools, in-app, instream video, and native advertising.”¹⁶⁹ Prof. Ghose argues that advertisers “reallocate their advertising budgets more efficiently and in real time across different types of advertising formats, devices, and properties” and that this “undermines [my] opinion that open-web display advertising is differentiated.”¹⁷⁰
- (113) I do not dispute that many advertisers use multiple forms of digital advertising, or that advertisers can substitute across channels on the margin. Nevertheless, as with a hammer and screwdriver, advertisers can use multiple forms of advertising to achieve different objectives even if those forms may be potential substitutes for certain tasks.
- (114) However, with regard to the arguments made here, Google’s experts fail to apply the economic principles articulated by the HMT to determine whether a relevant product market is too narrow.
- (115) First, Dr. Israel and Prof. Ghose do not recognize that advertiser substitution alone, without consideration of publishers’ ability to substitute, would be insufficient to conclude that alternative

¹⁶⁷ Israel Report, ¶ 298. Dr. Israel also suggests that *within* open-web display advertising, publishers could shift from indirect to direct transactions. Israel Report, ¶ 278. In Section IV.B.4 of my initial report and Section IV.B.3 of this report I explain why indirect transactions provide additional distinct value to publishers compared to direct transactions.

¹⁶⁸ Lee Initial Report, § IV.A.2.

¹⁶⁹ Israel Report, ¶ 217–218.

¹⁷⁰ Ghose Report, ¶ 91. As a matter of economics, customer substitution—even if potentially immediate or in real time—does not “undermine” the existence of product differentiation. I also understand that Prof. Wilbur concludes that Prof. Ghose’s claims about the interchangeability of different digital advertising formats and properties are incorrect. *See* Expert Rebuttal Report of Kenneth Wilbur, Ph.D., February 13, 2024 (hereinafter “Wilbur Report”), § III.

forms of advertising could constrain the exercise of market power of a hypothetical monopolist over publisher ad servers, ad exchanges, or advertiser ad networks.¹⁷¹

- (116) Second, they fail to establish that advertisers view alternative forms of advertising as sufficiently close substitutes so that they would shift enough of their spending to different advertising channels to constrain a hypothetical monopolist of a single ad tech component (publisher ad servers, ad exchanges, or advertiser ad networks) from exercising market power, *even if all ad tech fee increases were passed through to advertisers* (which is unlikely to be the case, given the limited ability of publishers to substitute away from open-web display advertising tools).
- (117) There is evidence to the contrary. For example, GroupM’s Susan Schiekofer was asked in deposition, “If an exchange increases its display open auction take rates from 20 percent to 21 percent, would GroupM be more likely to try to shift impressions to another exchange, or to another type of advertising like insertion order-based display ads or social?” She replied “Unlikely to make big changes based on that unless there was some drop-off in performance.”¹⁷² Note that this question discusses substitution at AdX’s prevailing prices (20%) which are higher than competitive levels and is therefore stronger than evidence needed to satisfy a hypothetical monopolist test. If advertisers are unlikely to divert a significant amount of impressions in response to an increase on prices that are already at supracompetitive levels, it follows as a matter of economics that they would be even less likely to divert impressions in response to a price increase from competitive levels.
- (118) Additionally, direct evidence of Google’s exercise of market power over its ad tech products is a strong indicator that customer substitution alone would be insufficient to constrain a hypothetical monopolist in each of the relevant markets from exercising its own market power.¹⁷³
- (119) Prof. Ghose also points to numerous factors that “guide [advertisers’] budget reallocation decisions, such as CTRs, ad placement profitability, changes in consumer preferences, seasonal trends in product demand, and/or industry innovations that offer new opportunities for effective ad delivery.”¹⁷⁴ He does not discuss why a price increase on the cost of using ad tech tools (which is unlikely to be fully borne by advertisers) would generate changes in advertising costs of sufficient magnitudes to alter advertisers’ decisions.
- (120) I next turn to specific arguments and examples Dr. Israel and Prof. Ghose offer as to advertiser substitution.

¹⁷¹ See Sections III and IV.A.3 above

¹⁷² Deposition of Susan Schiekofer (GroupM), September 26, 2023, 105:21–106:8.

¹⁷³ See Lee Initial Report, § V.

¹⁷⁴ Ghose Report, ¶ 112.

IV.B.2.a. Advertiser allocation of marketing spend does not demonstrate that advertiser substitution is sufficient to constrain the exercise of market power in the relevant markets

- (121) Google’s experts claim that I ignore “how advertisers’ ability to closely measure the performance of display advertising enables them to shift their budgets dynamically and fluidly between...different formats, devices, and properties.”¹⁷⁵ In purported support of this claim, Google’s experts highlight select documents that advertising customers allocate their budgets between display and integrated social media advertising.¹⁷⁶ Prof. Ghose also describes tools that advertisers use to assess ROI of different marketing channels and reallocate budgets.¹⁷⁷
- (122) However, these documents and discussion do not support their claim.¹⁷⁸ The presented documents indicate that advertisers value multiple forms of advertising. Some may reflect re-allocations on the margins, but do not indicate complete or substantial substitution away in response to supracompetitive ad tech fees. For example:
- Dr. Israel points to a US Census Bureau study as support for his claim that “[a]dvertising customers, including the United States government...appear to view the relevant market more broadly” but that document confirms the US Census Bureau views different types of advertising as distinct. For example, as shown below, the document distinguishes “Social” and “Non-Social” and within those categories, “Banner” and “Video,” and the quote Dr. Israel highlights is listed under the conclusion **“Engagement differed greatly between different types of advertisements.”**¹⁷⁹

¹⁷⁵ Ghose Report, ¶ 92. *See also*, Israel Report, ¶¶ 223–224.

¹⁷⁶ Ghose Report, ¶¶ 99–116; Israel Report, ¶¶ 223–224. Dr. Israel claims that “[t]he set of such relevant substitutes depends on the strategy of the advertiser” suggesting that some advertisers “seek to maximize return on investment (ROI) and other advertisers are “seeking access to a specific set of user attention” but these two strategies are tied together: advertisers interested in reaching a particular set of users or demographics may be seeking them out because of the expected higher return on investment.

¹⁷⁷ Ghose Report, ¶¶ 99–116.

¹⁷⁸ I understand that Prof. Wilbur has also evaluated Prof. Ghose’s claims regarding advertiser budget allocation and concludes that Prof. Ghose incorrectly conflates advertiser “fluidity” with interchangeability. *See* Wilbur Report, § IV.

¹⁷⁹ Israel Report, ¶ 223; CENSUS-ADS-0000074369, at -397–398, -400, -405 (01/06/2023). (emphasis in original). Dr. Israel quotes “[s]ocial media and non-social display advertisements are more comparable in form, function, and deployment, and their rates of engagement are more similar, although social media advertisements had a higher click rate and response-per-impression rate overall,” but he fails to provide context that the study describes them as more comparable to one another *than to search advertisements*. That social media and display are “more comparable” than search does not mean they are close substitutes; just as a hammer and screwdriver being more comparable to one another than to a wrench does not make them close substitutes. In fact, Dr. Israel’s quote falls under the conclusion **“Engagement differed greatly between different types of advertisements,”** and elsewhere the study found that media advertisements had “a higher click rate (0.3 percent vs. 0.1 percent)” and “substantially higher response per-impression rate (0.0050 percent vs. 0.003 percent).”

Figure 7. Excerpt from 2020 Census Evaluation Report: Investigating Digital Advertising and Online Self-Response**Table 6. Responses by Referral Source.**

Referral Source	Sufficient Response Count	Sufficient Response %
Census Mailer	35,052,960	39.3%
Mailer URL	34,879,002	39.1%
Mistyped Mailer URL	173,958	0.2%
Digital Advertisement or Promotional Material	21,317,822	23.9%
Non-Social Display Advertisement	114,444	0.1%
Non-Social Banner Advertisement	84,678	0.1%
Non-Social Video Advertisement	25,982	<0.1%
Unknown Non-Social Advertisement Format	3,784	<0.1%
Social Media Display Advertisement	346,323	0.4%
Social Media Banner Advertisement	219,356	0.2%
Social Media Video Advertisement	124,362	0.1%
Unknown Social Media Advertisement Format	2,605	<0.1%
Civic Engagement Activity	2,600,411	2.9%
Search Advertisement	18,256,144	20.5%
Other or Unclassified Ad	500	<0.1%
Advertising Campaign URL	11,701,094	13.1%
Non-Advertisement Website	12,810,096	14.4%
Non-Advertisement Search Results	10,595,739	11.9%
Non-Advertisement Social Media Post	410,573	0.5%
Other Non-Advertisement Website	1,803,784	2.0%
Census Operation / Other Source	580,519	0.7%
Uninterpretable Referral Paradata	688,475	0.8%
No Referral Paradata	7,074,516	7.9%
Grand Total	89,225,482	100.0%

Source: U.S. Census Bureau, 2020 Census, 2020 ISR Paradata and CURL

- Prof. Ghose cites an email from Centers for Medicare & Medicaid Services to "[i]nvestigate shifting budget from GDN to Facebook" which offers no specific recommendation.¹⁸⁰ However, it separately notes "approval to shift \$30K from YouTube to Google AdWords. YouTube will have an updated budget of \$70K and will still run for the rest of the campaign just at lower levels," consistent with the notion that advertisers re-allocate portions of their spend rather than completely substituting away.¹⁸¹
- Dr. Israel claims "U.S. agency advertisers indicate that they shift budget allocations between display advertising and social media advertising," but the email he cites notes they want to "buy

¹⁸⁰ Ghose Report, ¶ 116; CMS-ADS-0000181785, at -785 (11/09/2018).¹⁸¹ CMS-ADS-0000181785, at -785 (11/09/2018).

BEYOND digital display/video...to buy additional media outside of display/video” and still retains a significant portion of the budget in display.¹⁸²

- Prof. Ghose highlights a NYSERDA document recommending “[i]ncrease Paid Social budget by 50%, shift from Digital Placements” but neglects to contextualize that shift.¹⁸³ The document indicates that 94% of impressions are associated with “Digital Advertising” as compared to 6% with “Paid Social,” so a 50% increase in “Paid Social” likely represents a relatively small shift from “Digital Placements.”¹⁸⁴
- Prof. Ghose cites a document from Texas A&M University that notes “[b]udget allocation will shift monthly across channels on performance and efficiency.”¹⁸⁵ Notably, the document allocates budget to all four channels (Display, Search, Facebook/IG, and Retargeting) and has a distinct “Strategy” for each, where “Display Advertising” “[t]arget[s] ads to audiences based on the content they are engaging with or based on their online behaviors” and “Social Media Advertising” “[t]arget[s] ads based on key demographics and behavioral characteristics (age, education, field of study, school, job industry, employer, skills, groups, interests, etc.)”¹⁸⁶
- Prof. Ghose also cites deposition testimony that corroborates that advertisers use different forms of advertising for different tasks (e.g., “depending on the goal of the campaign, might Comcast shift its spend between the various channels? A. Yes”).¹⁸⁷

- (123) Prof. Ghose and Dr. Israel also cite documents and advertiser testimony that advertisers reallocate spend in response to performance indicators such as return on investment (ROI) and return on ad spend (ROAS).¹⁸⁸ But these documents and testimony do not indicate that advertisers would re-allocate a substantial portion away in response to a small increase in the cost of open-web display ads, let alone open-web display *ad tech fees*.
- (124) Indeed, that advertisers continue to allocate spend to a mix of channels despite differences in ROI and ROAS calculations per channel suggests they would not make significant allocation changes in

¹⁸² NAVY-ADS-0000349092, at -092–093 (09/14/2018). The email proposing shifting \$1,400,000 among CPL/Job Sites (\$300,000), Paid Social (\$300,000), and Paid Search (\$800,000) leaving \$600,000 for Display (\$2,200,000 – \$1,400,000). The resulting “modified Pricing Proposal” retains “\$7,000,000 for display/video” out of “\$8,400,000 TOTAL” over “July Aug Sept Oct.”

¹⁸³ Ghose Report, ¶ 116; NYSERDA0001121, at -126 (05/16/2019).

¹⁸⁴ NYSERDA0001121, at -124, -125 (05/16/2019). There are 227,874 “Paid Social” impressions and 3,429,065 “Digital Placements” impressions. $227,874 \div (227,874 + 3,429,065) = 6\%$.

To illustrate why a 50% increase in Paid Social results in a smaller decrease in Digital Placements, if CPM were twice that of Digital Placements, a 50% increase in Paid Social would result in a 7% decrease in Digital Placements ($227,874 \times 2 \times 50\% \div 3,429,065 = 6.6\%$).

¹⁸⁵ TAMU 000537, at -575 (2021).

¹⁸⁶ TAMU 000537, at -569, -571, 575 (2021).

¹⁸⁷ Ghose Report, ¶ 116, citing the Deposition of Kristy Kozlowski (Comcast), United States of America, et al. v. Google LLC, U.S. District Court, Eastern District of Virginia, Case No. 1:23-cv-00108-LMB-JFA, September 6, 2023, 45:3-6.

¹⁸⁸ Ghose Report, ¶ 114-117; Israel Report, ¶ 177.

response to a small increase in the cost of ad tech fees. Consider a United States Postal Service (USPS) document highlighted by Prof. Ghose as “suggesting USPS ‘[c]onsider shifting a portion of spend from Display to Social.’”¹⁸⁹ This document indicates that USPS allocates spend across eight channel categories¹⁹⁰ even though Total ROAS ranges from \$10.41 (Direct Mail) to \$33.57 (Social), with an ROAS of \$12.81 for Digital Display.¹⁹¹ Moreover, the magnitude of those differences suggests that a small increase in the price of ad tech tools and resulting change in ROAS is unlikely to cause an advertiser who already accepts larger differences in ROAS across channels to make significant reallocation decisions.¹⁹² Other documents demonstrate that advertisers invest in multiple channels despite ROAS differences. [REDACTED]

[REDACTED]

[REDACTED]

- (125) Google’s experts also present analyses of advertiser spending demonstrating that advertisers such as Fitbit, Comcast, Nike, and Macy’s allocate different shares of their advertising spend to open-web display and other channels.¹⁹⁴ Like the documents they cite, their analyses merely demonstrate that advertisers use multiple forms of advertising and spending may vary over time across forms; they do not, however, support the claim that advertiser substitution would be sufficient to constrain a hypothetical monopolist from increasing ad tech prices in any of the relevant markets.¹⁹⁵
- (126) Neither expert presents evidence that these shifts in allocation are in response to changes in relative prices or costs. Nor do they account for alternative explanations, including changes in marketing strategy over time, or focuses on different products or different consumers over time.¹⁹⁶ Indeed, Prof. Ghose identifies numerous factors that “guide [advertiser] budget reallocation decisions, such as CTRs, ad placement profitability, changes in consumer preferences, seasonal trends in product

¹⁸⁹ Ghose Report, ¶ 116.

¹⁹⁰ TV/Video, Search, Digital Display, Direct Mail, Radio/Audio, Print, Cinema, Social.

¹⁹¹ USPS-ADS-0000160382, at -395 (11/2018).

¹⁹² [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

¹⁹³ OMC-GOOG-00046776, at -794 (06/24/2019); NIKE0000108, at -145 (02/26/2021).

¹⁹⁴ Israel Report, ¶¶ 231-234, Figure 26, Figure 27, Table 3; Ghose Report, Figure 21, Figure 22.

¹⁹⁵ They also do not demonstrate that the budget allocations they identify are substitution at all. In Figure 78 in Appendix B, I recreate Dr. Israel’s Table 3 in levels instead of percentages. Though spending patterns vary by advertising, total spending on both “ad tech tools” and “social” has increased from 2019 to 2022.

¹⁹⁶ One also might observe similar shifts by any firm with budget constraints. A firm might choose to invest in marketing one year, hire more employees the following year, and upgrade its office space the third year, but those budget allocation patterns for a firm would not be sufficient to conclude that marketing, labor, and office space are part of a relevant antitrust market.

demand, and/or industry innovations that offer new opportunities for effective ad delivery,” any of which could explain the patterns in Google’s experts’ analyses.¹⁹⁷

- (127) I also understand that Prof. Wilbur has assessed Dr. Israel’s analysis of Fitbit (Figure 26) and Comcast (Figure 27) and concludes that Dr. Israel’s analysis shows that different digital display advertising formats are not interchangeable.¹⁹⁸
- (128) Last, Prof. Ghose argues that the distinctions I draw between open-web display and other forms of digital advertising relies on a marketing concept that is “outdated and understates the fluidity of advertisers’ spending.”¹⁹⁹ Prof. Ghose draws an artificial distinction between my reference to the allegedly “outdated” term “marketing funnel” (a term also used by current Google employees and documents and other industry participants) and what he calls the non-linear “consumer decision journey.”²⁰⁰ Yet both terms simply refer to the notion that consumer purchasing decisions involve multiple stages at which the effectiveness of advertising will vary.²⁰¹ To the extent Prof. Ghose is suggesting that the non-linearity of that journey means that marketing targeted at different stages are perfect substitutes, his assertion is inconsistent with standard marketing textbooks, testimony and documents from Google and other industry participants, and his own research publications.²⁰²

¹⁹⁷ Ghose Report, ¶ 112.

¹⁹⁸ See Wilbur Report, § III.B.5

¹⁹⁹ Ghose Report, ¶ 93

²⁰⁰ Ghose Report, ¶ 93-94. See e.g., Lee Initial Report, n. 33, 382, and 386 for examples of industry participants continuing to use the term.

²⁰¹ See e.g., Lee Initial Report, n. 34, quoting from Philip Kotler and Kevin Lane Keller, *A Framework for Marketing Management*, 16th ed. (Pearson Education, 2016): 122 (“A consumer’s purchase journey need not be linear, as a consumer may revisit stages or proceed in a different ordering prior to making a purchase. The effectiveness of different forms of advertising will still vary depending on an advertiser’s objective and the consumer’s awareness, interest, and desire”). I understand that Prof. Wilbur also concludes that these concepts are interchangeable and that Prof. Ghose’s criticism of my analysis is misleading and incorrect. See Wilbur Report, § V

²⁰² Lee Initial Report, §§ II.A.2, IV.B.2.a, n. 34; Vilma Todri, Anindya Ghose, Param Vir Singh, “Trade-Offs in Online Advertising: Advertising Effectiveness and Annoyance Dynamics Across the Purchase Funnel,” *Information Systems Research*, 2020, vol. 31, no. 1:102–125. <https://doi.org/10.1287/isre.2019.0877> (“Investigating the dynamics of these annoyance effects, we reveal that consumers who reside in different stages of the purchase funnel exhibit considerably different tolerance for annoyance stimulation” and “Third, the proposed technique enables us to study the structural dynamics of the effective and annoying advertising effects—even within a purchase funnel—by allowing the magnitude of these effects to be contingent on the latent state in which consumers reside.”); Anindya Ghose, “One Additional Minute of Exposure to Display Advertising Can Boost Direct Traffic to a Company’s Website by 10%”, LinkedIn, September 8, 2016, <https://www.linkedin.com/pulse/one-additional-minute-exposure-display-advertising-can-anindya-ghose/> (“When a consumer is targeted earlier in the purchase funnel, one additional minute of exposure to display advertising can increase the likelihood he/she will visit a company website by almost 10%.”).

IV.B.2.b. Survey evidence relied on by Dr. Israel does not demonstrate that advertiser substitution is sufficient to constrain the exercise of market power in the relevant markets

- (129) In his report, Dr. Israel relies on a survey by Prof. Simonson to argue that “advertisers would, in fact, shift substantial spend to social media as well as other digital advertising channels in response to a small but significant increase in the cost of programmatic open web display advertising.”²⁰³
- (130) As I discussed above, taking Dr. Israel’s representation of these survey results at face value,²⁰⁴ these estimates do not indicate that the HMT would fail in any of the relevant markets.
- First, a price increase in the cost of programmatic open-web display advertising is *not the same* as a price increase in the cost of a set of ad tech tools (see Section IV.B). A price increase in ad tech tools is not fully borne by advertisers, and for the same percentage change would likely lead to a smaller percentage change in the cost of advertising.
 - Second, these estimates of advertiser substitution to alternative channels are obtained at existing or prevailing prices. When prices are already supracompetitive, these estimates likely overstate substitution patterns at more competitive ad tech prices, which is the relevant benchmark for the purposes of market definition (see Section IV.A.2).
 - Third, evaluating advertiser substitution alone without considering the ability of open-web publishers to substitute is insufficient to conclude that an HMT over a set of ad tech tools would fail (Section III, IV.A.3). Indeed, a fee increase for ad tech tools could lead to *no meaningful increase in the cost of programmatic display advertising* if nearly the entirety of fee increase was borne by open-web publishers in the form of lower payouts.
- (131) Even setting these issues aside, Dr. Israel’s discussion of Prof. Simonson’s survey does not support the claim that there would be sufficient advertiser substitution to defeat an exercise of market power by a monopolist in any of the relevant product markets. This is for the following reasons.
- (132) First, according to Dr. Israel, Prof. Simonson’s survey finds that “more than half of advertiser sand agencies would divert spending to other types of digital advertising in response to an increase in the cost of programmatic open web display advertising.”²⁰⁵ As shown in Dr. Israel’s Figure 29, a significant share of advertisers (36 to 43 percent) responded that they would not divert *any* spending, which supports the claim that programmatic display advertising as a channel is distinct and valuable

²⁰³ Israel Report, ¶ 236.

²⁰⁴ I also understand that Prof. Hoyer has identified numerous flaws in Prof. Simonson’s survey upon which Dr. Israel relies (see generally Expert Rebuttal Report of Wayne D. Hoyer, Ph.D., February 13, 2024, (hereinafter “Hoyer Report”), § III). With respect to this question, I understand Prof. Hoyer concludes that the survey data are also unreliable due to differences in respondents’ interpretations of the question and because the question prompts respondents to indicate that they would divert spending. See Hoyer Report, § III.B.1.

²⁰⁵ Israel Report, ¶ 236

to advertisers.²⁰⁶ Indeed, Dr. Israel’s interpretation of these survey results does not demonstrate (nor does he opine based on these results) that the HMT would fail for any of the relevant product markets.

- (133) Second, the way that Dr. Israel reports some of these survey results can overstate the closeness of any potential substitute types of advertising.²⁰⁷
- (134) For example, Dr. Israel reports that the highest percentage of advertisers that “would divert spending to other types of digital advertising in response to an increase in the cost of programmatic open web display advertising” is among “Advertisers < \$500K” (64%).²⁰⁸ Dr. Israel also displays the “other digital advertising alternatives” that “those advertisers who would switch would switch to,” with the highest category being “Social” at 58%.²⁰⁹ However, this percentage is only among those advertisers who would divert spending. Combining these two percentages, and taking Dr. Israel’s figures from Prof. Simonson’s survey at face value, suggests that only 37% of lower-spend advertisers would divert spending to social²¹⁰—or, put another way, that 63% of lower-spend advertisers would not divert *any* of their programmatic display advertising spend to social media advertising in the face of a small but significant price increase in the cost of programmatic display advertising.²¹¹
- (135) The *amount of spending* that would be diverted to any given category is similarly reported by Dr. Israel only among those respondents who responded that they would shift spending.²¹² Dr. Israel does not explain how reported spending changes “on a scale of 0 to 10” translates into a finding that the relevant product markets are not well-defined.²¹³
- (136) Last, I understand that Prof. Hoyer discusses further details of Prof. Simonson’s survey.

IV.B.2.c. The presence of other forms of ad inventory identified by Dr. Israel and Prof. Ghose does not demonstrate that advertiser substitution is sufficient to constrain the exercise of market power in the relevant markets

- (137) Though Dr. Israel acknowledges that “open web display advertising has certain features that may distinguish it from other forms of advertising” he nevertheless argues I “exclude[] [from the relevant product markets] important alternative sources of advertising inventory to which advertisers could turn if the cost of open web display advertising increased,” specifically “properties using integrated

²⁰⁶ Israel Report, Figure 29.

²⁰⁷ Israel Report, n. 273, Figure 30.

²⁰⁸ Israel Report, ¶ 236, Figure 29.

²⁰⁹ Israel Report, ¶ 237, Figure 30.

²¹⁰ $64\% \times 58\% = 37\%$. Israel Report, Figures 29, 30.

²¹¹ This example uses the highest category of diversion shown in Dr. Israel’s figures. Every other combination of advertiser category and advertising type yields an even lower percentage: e.g., Dr. Israel’s figures show that only 13% of ad agencies answered they would divert spend to “App/In-App” advertising “in response to an increase in the cost of programmatic open web display advertising”. ($57\% \times 23\% = 13\%$). Israel Report, Figures 29, 30, ¶ 236.

²¹² Israel Report, ¶ 238, Figure 31.

²¹³ Israel Report, Figure 31, n. 275.

advertising tools, in-app, instream video, and native advertising.”²¹⁴ Dr. Ghose similarly argues I “exclude” alternative sources of advertising.²¹⁵

- (138) Dr. Israel is incorrect in stating that the relevant product markets “exclud[e] certain tools *because* they facilitate sales of different types of advertising.”²¹⁶ These product markets include certain ad tools (publishers ad servers, ad exchanges, and advertising ad networks) if they facilitate open-web display advertising—a distinct form of advertising that is valuable to advertisers and publishers. Tools are excluded if they *cannot* facilitate open-web display advertising, not because they also facilitate another form of advertising. As long as an ad tech product can facilitate open-web display transactions as a publisher ad server, an ad exchange, or an advertiser ad network, it is in one of the relevant product markets.
- (139) As another example, consider Facebook Audience Network (FAN). Prof. Ghose criticizes me for distinguishing “open web display advertising” from advertising on “apps or owned-and-operated (O&O) properties.”²¹⁷ He argues that the distinction between open-web display advertising and O&O properties is undercut by properties like FAN, which “enables advertisers to purchase inventory on apps outside of the Facebook social network.” But FAN is a product contained in the advertiser ad network market during the periods in which it was available to customers seeking to transact open-web display transactions; indeed, FAN’s open-web transactions are clearly visible in orange in Figure 56 of my initial report (until FAN exited the market in April 2020).

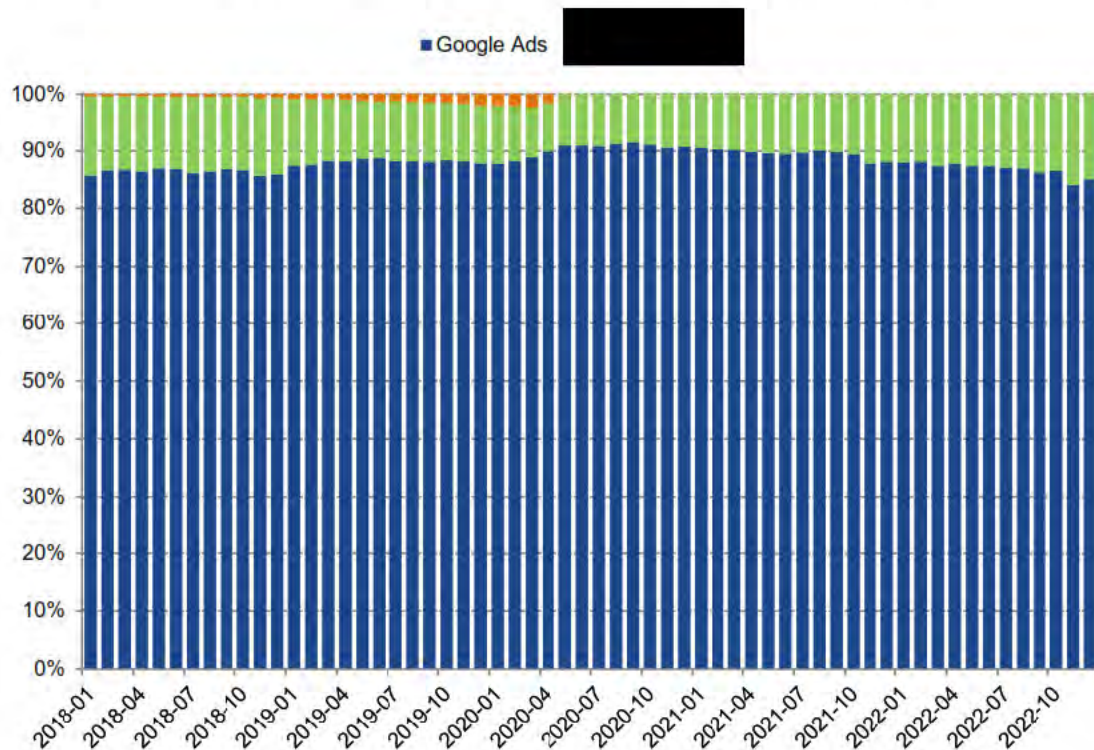
²¹⁴ Israel Report, ¶¶ 170, 217–218.

²¹⁵ “Plaintiffs’ experts exclude from their concept of ‘open web display advertising’: (i) formats such as native and instream advertising, and (ii) properties such as social media properties, retailer properties, CTV platforms, and advertising on mobile apps.” Ghose Report, ¶ 24. Though Dr. Ghose uses slightly different categorizations of properties than Dr. Israel, advertisements on those properties are either open-web display or overlap with Dr. Israel’s categories.

²¹⁶ Israel Report, ¶ 188 (emphasis in original).

²¹⁷ Ghose Report, ¶ 36.

Figure 8. Figure 56 from Lee Initial Report (“Google Ads has maintained a substantial share of worldwide indirect open-web display impressions among advertiser ad networks (2018–2022)”)



Source: Google Ads data (DOJ RFP 54); Bidding tools panel (See Appendix H.1.b).

Notes: Denominator includes open-web display impressions from Google Ads, [REDACTED]. Impressions include all indirect open-web display transactions from these parties. FAN exited the open-web display market in April 2020.

- (140) Google’s experts err by asserting that if transactions are restricted to open-web display advertisements for the purposes of computing market shares (even among products that can facilitate non-open-web display transactions), then non-open-web display “transactions” are “excluded” from the relevant product markets. Again, such an error arises from Google’s experts confusing the underlying display ads for the ad tech tools used to sell those advertisements (see Section IV.B). As I note there and in my initial report,²¹⁸ for the purposes of computing market shares (which are used as indirect evidence of market power, *not as the basis for defining relevant markets*), I restrict attention to open-web display transactions so as to illuminate, not obscure, the extent to which Google possesses market power over different sets of ad tech products. However, this does not mean that ad tech products that *could also* be used to sell other forms of advertising are necessarily excluded as products from the relevant markets.

²¹⁸ Lee Initial Report, n. 576 (“Where possible, I exclude transactions that are sold through a publisher’s own integrated ad tech products from market share estimates. Limiting market share calculations to transactions fulfilled on ad inventory not owned and operated by an ad tech product more accurately reflects the competitive significance of a product’s ability to transact open-web display inventory.”).

- (141) Nevertheless, much of Dr. Israel's support for broadening the market to include other forms of digital ad inventory (which I also interpret to mean the inclusion of products that do not necessarily allow customers to transact open-web display advertising) comes in the form of arguments that I have already addressed.
- (142) For advertising on properties using integrated advertising tools, in-app advertising, and instream video, Dr. Israel cites to Prof. Simonson's survey to demonstrate that advertisers "multihome" and spend on different forms of digital advertising.²¹⁹ As a result, Dr. Israel argues that "if ad tech providers attempted to capture more of the value of matches on the open web, advertisers could simply shift more spending into apps to avoid those changes."²²⁰ But Dr. Israel confuses multihoming with substitution, as I explained in Section IV.A.4. He also ignores that even if advertisers exhibit highly elastic demand with respect to display advertising prices, this does not mean an ad tech provider would necessarily be constrained from exercising market power. For example, a hypothetical monopolist of ad tech tools in a relevant market could still charge supracompetitive fees and capture more of the value created by matches without advertisers seeing a price increase above competitive levels (if fee increases were borne by publishers), as I discussed in Sections III and IV.A.3.
- (143) Dr. Israel also cites to Prof. Simonson's survey as support for his assertion that advertisers would shift spend to properties using integrated advertising tools, in-app advertising, and instream video in response to a price increase.²²¹ But as I explained in Section IV.B.2.b, even taking Dr. Israel's interpretation of Prof. Simonson's survey results at face value, the results are still consistent with my opinion that programmatic display advertising is distinct and valuable to advertisers.
- (144) Finally, Dr. Ghose claims I "create an artificial distinction between what [I] call 'open web display advertising' and other online display advertising," citing to his own expertise and "market realities."²²² But Dr. Ghose's claims do not speak to market definition; as I explained in my initial report and in Section IV.A. of this report, relevant antitrust markets are based on demand-substitution—an aspect of market definition Dr. Israel and I agree on.^{223, 224} However, Dr. Ghose is also incorrect that the distinction is artificial. As I explain in my initial report, and as Dr. Israel recognizes, "Google and other industry participants acknowledge important distinctions between open-web display advertising and other forms of digital advertising," citing to numerous Google

²¹⁹ Israel Report, ¶¶ 235, 247, 251, Figures 28, 35, 38.

²²⁰ Israel Report, ¶ 247.

²²¹ Israel Report, ¶¶ 236–238, 248, 252, Figures 29–31.

²²² Ghose Report, ¶¶ 24, 28.

²²³ Israel Report, ¶¶ 150–151.

²²⁴ Additionally, as noted in my initial report, the label "relevant" serves to differentiate the analytic construct of a relevant market from other uses of the term "market": *see* 2010 HMG, § 4 ("Relevant antitrust markets defined according to the hypothetical monopolist test are not always intuitive and may not align with how industry members use the term 'market.'"); *See also* Jonathan B. Baker, "Market Definition: An Analytical Overview," *Antitrust Law Journal* 74, no. 1 (2007), 130 (labeling markets as relevant or antitrust markets "distinguish[es] these markets from what business executives and consultants might define for other purposes."). 2023 HMG § 4.3.D.3.

documents as well as documents and deposition testimony from other industry participants.²²⁵ For example, Google offers distinct ad tech products for (i) search,²²⁶ (ii) native,²²⁷ (iii) social,²²⁸ (iv) instream video²²⁹ consistent with these products serving different advertiser needs and functions.²³⁰

- (145) In the remainder of this Section, I discuss different forms of ad inventory identified by Dr. Israel and Prof. Ghose and explain why their analyses of advertiser substitution do not support the claim that the relevant markets are not well-defined.

IV.B.2.c.i. Advertising on properties using integrated advertising tools, including large social media properties

- (146) In my initial report I highlighted four reasons that from the perspective of advertisers, open-web display advertising is distinct from advertising on websites for publishers such as Amazon and Facebook that sell owned-and-operated display inventory using integrated tech products. Prof. Ghose purports to address each, but fails to undermine my claims and the distinct value of open-web display advertising to advertisers.

- *“Open-web advertising provides advertisers with the ability to reach more users, more frequently, than restricting advertising to applications or websites with integrated advertising sales.”*²³¹

Among other evidence, I highlighted a 2020 survey that consumers spend two-thirds of their time on properties not owned by major technology companies (such as Facebook, Instagram, and Amazon that use their own integrated ad tech).²³² Prof. Ghose argues that this two-thirds of

²²⁵ Lee Initial Report, § IV.B.3; Israel Report, ¶ 176 (“Notwithstanding Prof. Lee’s claim that ‘[i]ndustry participants recognize the distinctiveness of open-web display advertising,’ ordinary-course documents *also* make clear that there is a strong degree of competition between open web display advertising and other forms of digital advertising, the relevant point for market definition.”).

²²⁶ Lee Initial Report, ¶ 287, Figure 28 (“Google documents indicate that web display and search ads are viewed as reaching potential customers at different stages of the marketing funnel.”).

²²⁷ Lee Initial Report, ¶ 297 (“Consistent with content recommendation appealing to different advertising needs and advertisers, a 2020 Google presentation noted that a challenge for its Matched Content product was a ‘lack of [content recommendation]-specific advertisers.’”).

²²⁸ Lee Initial Report, ¶ 296 (“Consistent with the distinctions between Discovery ads and Google’s search and display ads illustrated above, Prabhakar Raghavan, Google’s Senior Vice President in charge of advertising and commerce products, testified that Google launched Discovery ads because advertisers were asking Google why they could not get the types of social ads from Google that they could get from Facebook and Instagram.”).

²²⁹ Lee Initial Report, ¶ 290 (“Google recommends that advertisers use instream video ads ‘when you have video content you’d like to promote before, during, or after other videos’ while outstream ads are preferable for advertisers who ‘want to expand the reach of your video ads ... helping you reach more customers.’”).

²³⁰ Though market definition is based on demand-side substitution which is distinct “from what business executives and consultants might define for other purposes” (Jonathan B. Baker, “Market Definition: An Analytical Overview,” *Antitrust Law Journal* 74, no. 1 (2007), 130), Google’s product offerings and assessments can be informative as to how customers view the interchangeability of products.

²³¹ Lee Initial Report, ¶ 300.

²³² Lee Initial Report, ¶ 300.

properties not owned by major technology companies still includes some integrated properties, but does not appear to dispute that users spend a significant amount of time on properties that do not use integrated advertising tools.²³³ Indeed, Google's own documents indicate the large volume of "addressable web display ad impressions" that are generated by consumers visiting sites without integrated ad tech tools.²³⁴

- *"Open-web display advertising and advertising on applications or publishers with their own integrated ad tech tools can reach different groups of consumers, or reach similar groups of consumers at different times."*²³⁵

Consistent with this, many advertisers promote products using both types of ad inventory.²³⁶ Prof. Ghose attempts to dispute my claims by presenting statistics regarding the overlap of open-web and social media users, and open-web and smartphone ownership. But even if these statistics were taken at face value, Prof. Ghose ignores that (i) users are on open-web properties and social media websites at different times, and (ii) not all smartphone users download and use the same set of mobile apps or browse the same websites.²³⁷

- *"Whereas advertising on websites with integrated ad-tech products show advertisements to users while they are within the publisher's web properties, open-web advertising tools can track and display advertisements to users on a broader set of websites as they navigate the web. This capability allows advertisers to reach users when they are conducting a web search for a product or considering a purchase decision on different websites."*²³⁸

Prof. Ghose does not dispute the broader set of websites available through open-web advertising tools. Rather, Prof. Ghose points to owned-and-operated properties allow for the purchase of inventory on other properties, highlighting Meta Audience Network (previously FAN).²³⁹ As I discussed above, FAN was included in my advertiser ad network market while it facilitated open-web display advertising, but it has since exited the market.²⁴⁰ Moreover, any advertising ad

²³³ Ghose Report, ¶ 37.

²³⁴ Lee Initial Report, Figure 42. See GOOG-AT-MDL-001263326, at -327 and -341 (08/2018); GOOG-DOJ-04442323, at -350 (09/11/2018).

²³⁵ Lee Initial Report, ¶ 301.

²³⁶ Lee Initial Report, ¶ 301.

²³⁷ Prof. Ghose disputes this by citing a statistic that "93% (= 4.95 billion / 5.3 billion) of worldwide internet users were social media users." But the report underlying Prof. Ghose's statistic notes that it is measure "active user identifies" which "do not represent unique individuals" and that may be distorted by factors such as duplicate and 'false' accounts." Ghose Report, ¶ 38; Simon Kemp, "Digital 2023 October Global Statshot Report," Data Reportal", October 19, 2023, <https://datareportal.com/reports/digital-2023-october-global-statshot>. Prof. Ghose cites Ani Petrosyan, "Number of internet and social media users worldwide as of January 2024," January 31, 2024, <https://www.statista.com/statistics/617136/digital-population-worldwide/>, which contains a source link to the "Digital 2023: October Global Statshot Report."

²³⁸ Lee Initial Report, ¶ 302.

²³⁹ Ghose Report, ¶ 39.

²⁴⁰ Prof. Ghose states erroneously that Meta Audience networks is still available on third-party websites. Ghose Report, ¶

network, ad exchange, or publisher ad server (even those owned by companies like Amazon or Facebook) that allowed for the purchase of open-web display advertising would be contained in one of the relevant product markets.²⁴¹

- *“Advertising through integrated platforms often requires the advertiser to use the website’s own ad tech tools, and to manage their budgets across different integrated and non-integrated ad tech products independently.”*²⁴²

Prof. Ghose identifies limited examples of owned-and-operated platforms that make inventory available through DSPs,²⁴³ but does not claim that this the case for certain large integrated platforms (including Amazon, Google and Meta’s O&O properties).²⁴⁴ Moreover, to the extent that inventory is available through third-party ad tech tools like ad exchanges, such transactions would be included in the relevant market share calculations and my analyses of the relevant markets.

- (147) Dr. Israel does not address the four reasons that I identified above, but nevertheless asserts that advertisers could switch from open-web display advertising ad tech tools to integrated advertising tools in response to a price increase.²⁴⁵ He also asserts that an advertiser could then reach the same user through a different site—e.g., Facebook or Instagram—that they would otherwise reach on an open-web publisher’s website.²⁴⁶ To support his assertions, Dr. Israel points to Google documents, “cross-visitation data,” and “advertiser multi-homing.” I discuss next why these do not establish that advertisers view advertising on properties using integrated ad tech tools as sufficiently close

63 (“Meta Audience Network allows advertisers to leverage data on Meta users ... to target their desired audience effectively across not only Meta’s own properties, but also the websites and apps of third parties.”). As I explain in the Lee Initial Report, “Meta Audience Network (formerly Facebook Audience Network) facilitated advertising transactions to open-web publishers until 2020, when it shifted focus to advertising on Meta O&O properties and select third-party mobile apps.” Lee Initial Report, ¶ 101. *See also*, Allison Schiff, “Facebook is Killing Off Its Web Supply In Audience Network – And Don’t Be Surprised If It All Shuts Down,” *adexchanger*, February 5, 2020, <https://www.adexchanger.com/platforms/facebook-is-killing-off-its-web-supply-in-audience-network-and-dont-be-surprised-if-it-all-shuts-down/>; Meta, “Changes to Web and In-stream Placements,” accessed February 11, 2024, <https://www.facebook.com/business/help/645132129564436>; Meta, “Meta Audience Network,” accessed February 11, 2024, <https://www.facebook.com/audiencenetwork/>.

²⁴¹ In Section III.B of Prof. Ghose’s report, he argues that some self-supply ad tech products also facilitate the sale of open-web display impressions. As I discussed in Section V of my initial report, to the extent that there are tools that facilitate the sale of both open-web and self-supply display inventory, those tools are in my markets, but the relevant set of transactions to assess their competitive significance in the relevant markets is their open-web display transaction volume. Examples of these tools include FAN, Xandr, Yahoo, and Google. Note that X Audience Platform, which Prof. Ghose provides as an example of an integrated ad product that facilitates third-party ad sales, does not allow for the purchase of web ad inventory. “X Audience Platform”, X Business, accessed February 11, 2024, <https://business.twitter.com/en/help/campaign-setup/twitter-audience-platform.html>

²⁴² Lee Initial Report, ¶ 303.

²⁴³ Ghose Report, ¶ 40. There is limited detail available to verify Prof. Ghose’s claims because several of the sources are either very new (e.g., Disney’s deal in October 2023) or very old (e.g., a Twitter reference to 2014).

²⁴⁴ Google considers these large integrated platforms unaddressable. *See* Lee Initial Report, Figure 42. *See also*, Lee Initial Report, ¶ 279, Lee Initial Report, n. 162, Lee Initial Report, n. 594, Lee Initial Report, n. 31.

²⁴⁵ Israel Report, ¶ 221.

²⁴⁶ Israel Report, ¶¶ 219–221.

substitutes to constrain a hypothetical monopolist of a single ad tech component (publisher ad servers, ad exchanges, or advertiser ad networks) from exercising market power over advertisers and open-web publishers.

- (148) **Documents.** Dr. Israel first highlights a number of Google documents he claims support his assertion because they reference Facebook and Amazon as potential competitors.²⁴⁷ But as Dr. Israel recognizes, market definition analyzes “demand-side substitution” and “products that are reasonably interchangeable from the point of view of customers.”²⁴⁸ That Google documents discuss other firms as competitors does not speak to their substitutability from the perspective of customers. Though it may be common for firms to look at different levels of competition or look at their business in both broad and narrow groupings of competing products, that does not make those groupings antitrust markets.²⁴⁹
- (149) Dr. Israel also mischaracterizes Google’s documents. For example, he quotes selectively from a Google document that states “[a]rguably, Facebook is one of the biggest competitive threats to Google” but ignores that the document summarizes the “competitive threat [Facebook] presents to various areas of Google’s business” and that it elsewhere notes that “Google is an *undisputed leader of ad tech* and offers pubs a compelling end to end solution for all their needs, while *Facebook has pulled back from ad tech after more limited success*. Where Facebook offers the biggest competitive threat is ad formats, specifically native, where it currently wins in implementation and performance.”²⁵⁰ And notably, Dr. Israel’s documents about Facebook predate FAN’s exit from open-web display in April 2020.²⁵¹
- (150) Similarly, Dr. Israel quotes from a 2018 Google document that “Amazon is an existential threat” but ignores that the document is assessing Amazon holistically across a variety of product offerings; and that for ad tech tools specifically it describes “Ad Server” as “Threat Low”; “Ad Network” as “Threat Medium Focus on remarketing & product ads” and “Ad Exchange” as “Threat N/A.”²⁵²

²⁴⁷ Israel Report, ¶¶ 176, 222.

²⁴⁸ Israel Report, ¶ 153.

²⁴⁹ Jonathan B. Baker, “Market Definition: An Analytical Overview,” *Antitrust Law Journal* 74, no. 1 (2007), 130 (labeling markets as relevant or antitrust markets “distinguish[es] these markets from what business executives and consultants might define for other purposes.”).

²⁵⁰ GOOG-DOJ-11788944, at -946–947, -979 (08/01/2019) (emphasis added). *See also*, -981 (“We cannot underestimate the value of a full stack when it comes to owning the tag and successfully competing with FAN. Partners can consolidate native within their overall workflow seamlessly, everything from demand management through mediation to measurement and analytics through GA/Firebase. This is the area where Facebook cannot come close to competing, especially as they have taken a step back from adtech in 2016 to date.”); -952 (“Facebook is a mobile first company...”); -956 (“...with Video and Mobile projected to drive long-term growth” (citing distinct growth categories of: Oculus VR, Graph Search, Instagram, Video Ads, Mobile App Install, Newsfeed – Desktop, Newsfeed – Mobile, Global RHS Display, Audience Network)).

²⁵¹ Israel Report, ¶ 222. Dr. Israel presents twelve documents that predate 2020 and one document from February 2020.

²⁵² GOOG-DOJ-12634156, at -160, -206 (01/16/2018). The two products that are labeled “Threat High” are “Paid Search”

- (151) Even where documents are not mischaracterized, they are consistent with Google protecting against others making inroads into open-web display, as I discussed in my initial report, and are not necessarily evidence that Google lacks monopoly power.²⁵³ They are also consistent with the Cellophane Fallacy that I discussed in Section IV.A.2 applying: i.e., once a firm exercises substantial market power within a relevant product market that has been monopolized, it will face greater competition from products outside of that market.²⁵⁴
- (152) Finally, Dr. Israel fails to consider the numerous documents from Google and other industry participants cited in my initial report that indicate the distinctiveness of open-web display advertising relative to other forms of digital advertising.²⁵⁵ These include, for example, a 2018 Google presentation showing Facebook and Amazon as part of the “unaddressable” segment of the web for its sellside display business,²⁵⁶ and a 2020 presentation noting how Discovery Ads is “positioned against Facebook” and how social ads target different segments of advertiser spend than its display ad products.²⁵⁷
- (153) **Cross-visitation data.** Dr. Israel also analyzes “cross-visitation data” from the market research firm Comscore, which “captures the fraction of internet users visiting a given reference property (like CNN) in a month who also visited other web properties (like The New York Times or Facebook).”²⁵⁸ He examines visitors to CNN, other top news properties, and top entertainment properties, and finds that their top cross-visited sites are properties using integrated advertising tools, such as Amazon, Facebook, Instagram, Walmart, and Twitter.²⁵⁹
- (154) But Dr. Israel’s charts merely show the obvious: that the publishers that choose to integrate are some of the largest individual publishers on the web. But size alone does not determine substitution

and “DSP.” Dr. Israel also quotes only the second half of a slide title, “[w]ith the addition of two new products, Amazon suite of ad solutions is increasingly encroaching on Google’s core business” and ignores that the two new products are “Paid Search (non-endemic) and “O&O Video (Amazon Video Ads).”

Similarly, Dr. Israel selectively quotes from a Google presentation that states “Amazon has developed key pillars of an advertising ecosystem that can compete with DoubleClick stack” but ignores the slide title that “Amazon is actively building a programmatic stack with a special focus on mobile app” and the conclusion of the slide that “Google has key assets including our scale and our full platform that can outperform Amazon and better serve the full needs of our partners.” GOOG-AT-MDL-003530782, at -792 and -810.

²⁵³ See Lee Initial Report, § VII.A, Appendix L.2.b, n. 1413. See GOOG-TEX-00035601, at -601 (12/09/2016). See also GOOG-TEX-00120775, at -786 (10/27/2016).

²⁵⁴ For example, Dr. Israel selectively quotes from a 2017 Google presentation that “[o]ur competitive focus is shifting to FB and AMZN as they gain momentum” but ignores the previous slide that states “[o]ur DRX product and sales focus is shifting away from traditional ad tech competitors [Rubicon, AppNexus, PubMatic] due to header bidding...News & Pub AdX compete and win rate has been steadily increasing with the rise of header bidding and EBDA...Header bidding has highlighted the value of DRX’s superior demand and full stack solution.” GOOG-DOJ-13952875, at -877, -878 (08/2017).

²⁵⁵ Lee Initial Report, ¶¶ 304–306.

²⁵⁶ GOOG-DOJ-04442323, at -350 (02/08/2018) (Google Sellside Monetization deck).

²⁵⁷ GOOG-AT-MDL-009638243, at -250–253, 274 (06/05/2020).

²⁵⁸ Israel Report, ¶ 226.

²⁵⁹ Israel Report, ¶¶ 226–230.

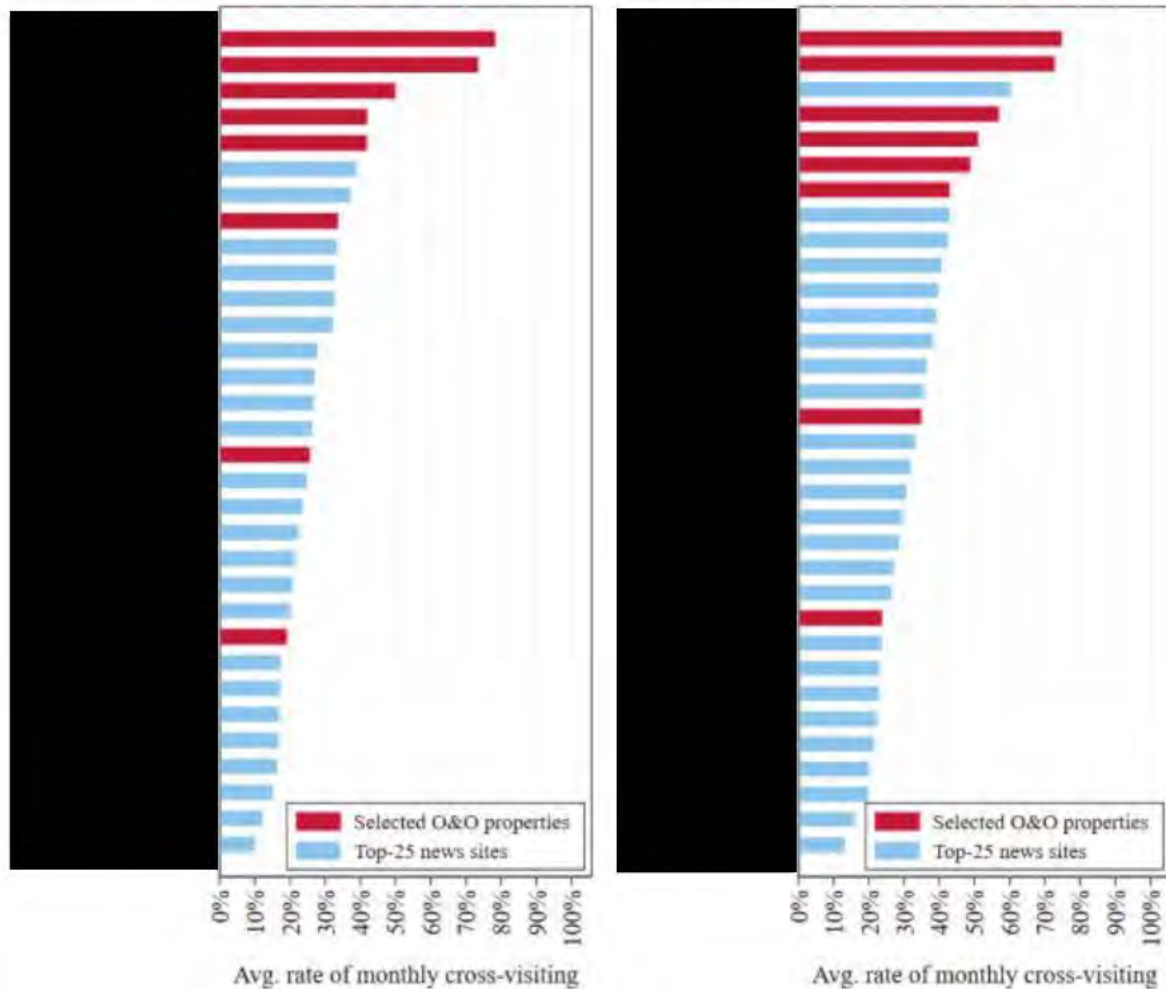
patterns; cross-visitation ignores other dimensions of targeting including intent and timing. The same user may respond differently to an ad they view when scrolling through a Facebook feed as compared to a banner ad they view on a website, as I explain in my initial report.²⁶⁰ For example, Dr. Israel could likely construct a similar chart showing that most users who visit CNN also travel on roads or highways (perhaps even more than the 80% who visit Amazon), but even he does not contend that roadside billboards are a close substitute to open-web display advertising.

- (155) Setting aside these flaws in Dr. Israel's analysis, his table (reproduced below) shows that at least 1 in 5 users could *not* be reached at all by substituting solely to the largest of these alternative sites. This is important because an integrated tool restricts an advertiser to visitors of that site. In contrast, open-web display provides access to a larger portion of online inventory *in combination*. For example, if a CNN user's second choice news site is split between The New York Times, The Washington Post, CBS News, and Fox News, a single open-web display tool could potentially allow an advertiser to reach all of those users. Put differently, the appropriate comparison is not one red (integrated) bar in Dr. Israel's chart to one blue (open-web) bar, but one-red bar to the set of users represented by *all* the blue bars combined.

²⁶⁰ Lee Initial Report, §§ II.A.2, II.A.3, IV.B.2.

Figure 9. Dr. Israel's cross-visitation analysis

Figure 24: Cross-Visiting from CNN (left) and Other Top 25 News Properties (right), 2022



Sources: GOOG-AT-DOJ-DATA-000066661 to -768 ([REDACTED])

- (156) **Multihoming.** Dr. Israel points to “multi-homing on open web display buying tools and advertising tools that are integrated with publisher properties.”²⁶¹ But as I explained in Section IV.A.4, Dr. Israel conflates multi-homing with substitution. Rather, the fact that advertisers purchase both types of inventory, in combination with the evidence I described above and in my opening report, is consistent with advertisers viewing both types of ad inventory as achieving different or complementary

²⁶¹ Israel Report, ¶ 239.

objectives.²⁶² I address other flaws in Dr. Israel's "multi-homing" analysis of bidding tools in Section IV.E.1.b.i.2.²⁶³

IV.B.2.c.ii. In-app advertising

- (157) In my initial report I explained that "from the perspective of advertisers, [open-web] advertising is distinct from advertising on applications."²⁶⁴ This is for several reasons, including some of the reasons discussed above for integrated properties: "open-web display advertising and advertising on applications...can reach different groups of consumers, or reach similar groups of consumers at different times,"²⁶⁵ and "open-web advertising tools can track and display advertisements to a broader set of websites as they navigate the web".²⁶⁶ I also noted that "in-app advertisements may be seen primarily by smartphone users, who have different characteristics than web users that are reached by web-display advertising."²⁶⁷ Neither Prof. Ghose nor Dr. Israel address these distinctions.
- (158) Rather, Dr. Israel points to the fact that "in-app advertising has accounted for an increasing share of spend on Google Ads" and that "individual advertisers frequently purchase both web and app inventory" and asserts that "[i]n-app advertising also offers an important alternative to open web display advertising."²⁶⁸
- (159) Dr. Israel's finding that app spending is growing is not surprising given the growing usage of apps and growing app advertising inventory over the past decade.²⁶⁹ Such growth is consistent with advertising patterns following consumer app usage. However, Dr. Israel's inference that such growth reflects substitution away from web spending is misleading. In Figure 10, which converts Dr. Israel's Figure 33 from percentages to dollars, it is clear that though Google Ads spending on apps has grown, spending on web has also grown. Growth in both segments, as well as Dr. Israel's finding that "advertisers buying both web and app impressions accounted for 90 percent of Google Ads spending" are consistent with the notion that advertisers view both forms of advertising as distinct and valuable.²⁷⁰

²⁶² I also note that Dr. Israel's Figure 32 compares advertisers who use Meta and advertisers who use Google Ads, but Google Ads can include inventory other than open-web display advertising.

²⁶³ I also note that taken at face value, Dr. Israel's figures assessing Dr. Simonson's survey imply that approximately 22–30 percent of advertisers do not use in-app advertising and that only 33–37 percent of advertisers "would shift at least some spend to social media." Israel Report, ¶¶ 235–237, Figure 28, Figure 29, Figure 30. 33–37 percent is calculated by multiplying each percentage that "will divert spending" from Figure 29 by the corresponding "Social" percentage in Figure 30.

²⁶⁴ Lee Initial Report, ¶ 299.

²⁶⁵ Lee Initial Report, ¶ 301.

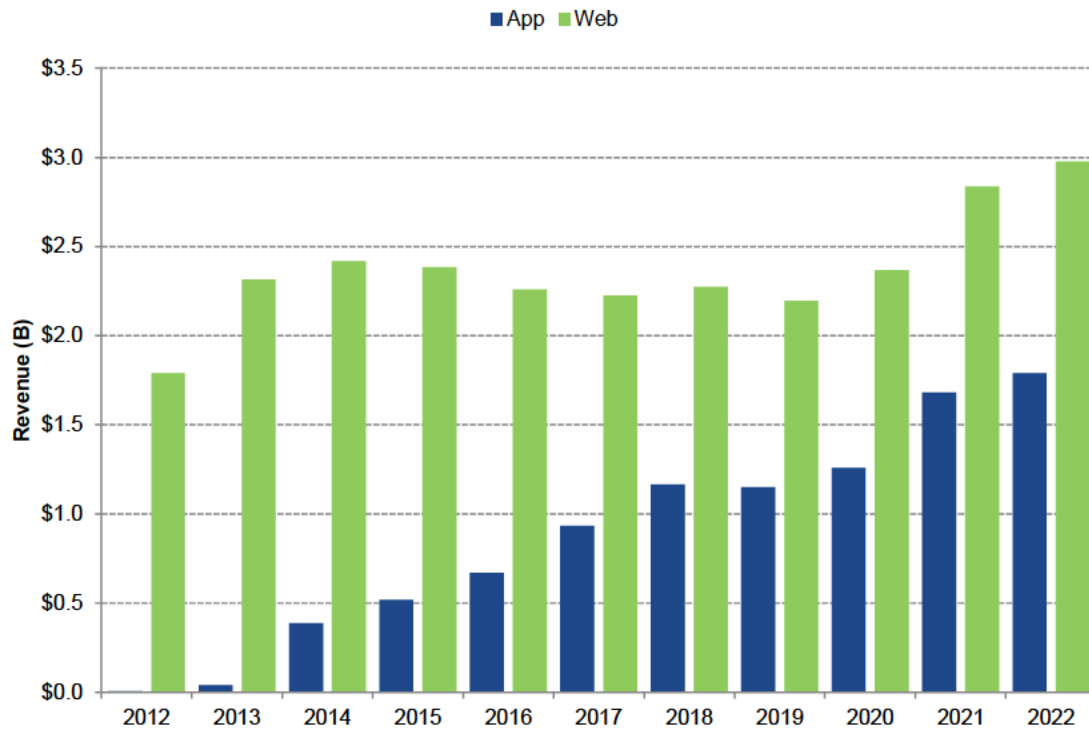
²⁶⁶ Lee Initial Report, ¶ 302.

²⁶⁷ Lee Initial Report, ¶ 301.

²⁶⁸ Israel Report, ¶¶ 244–246.

²⁶⁹ Israel Report, Figure 33.

²⁷⁰ Israel Report, ¶ 246.

Figure 10. Google Ads US non-video display ad spending by app vs. web (2012–2022)

Source: Backup materials for Israel Report, Figure 33: Google Ads data (DOJ RFP 7²⁷¹).

- (160) Dr. Israel also points to purported “multi-homing” and “substitution” statistics in Prof. Simonson’s survey, but neither support his assertion that advertisers view app inventory as a close substitute for web inventory.²⁷² Rather, taken at face value, they imply that approximately 60 percent of advertisers do not use in-app advertising and that only 13 to 19 percent of advertisers “would shift spend to in-app advertising in response to a small but significant increase in the price of open web display advertising” (which again is different than an increase in the fees charged by open-web display ad tech tools).²⁷³

²⁷¹ Throughout my report, I refer to the datasets I rely on using labels based on the DOJ’s Requests for Production (RFPs). The datasets I refer to as “DOJ RFP 7” are the same files Dr. Israel refers to as RFP 243. See Appendix C which contains a mapping of those labels to the Bates numbers of the corresponding datasets.

²⁷² Israel Report, ¶¶ 247–248.

²⁷³ Israel Report, ¶ 247 (“40 percent or more of advertisers and agencies that use open web display advertising also use in-app advertising.”); ¶ 248, Figure 29, Figure 30. 13–19 percent is calculated by multiplying each percentage that “will divert spending” from Figure 29 by the corresponding “App/In-App” percentage in Figure 30.

IV.B.2.c.iii. Instream video advertising

(161) In my initial report, I explained that:²⁷⁴

Instream and outstream video ads help advertisers meet different goals. Instream video advertisements tend to have a higher view rate and reach a more attentive audience since they are shown to users when they are already watching a video, while outstream video advertisements tend to reach a broader, but less engaged, audience since users can easily scroll past them or direct their attention elsewhere on the page. Google recommends that advertisers use instream video ads “when you have video content you’d like to promote before, during, or after other videos” while outstream ads are preferable for advertisers who “want to expand the reach of your video ads ... helping you reach more customers.”

Instream video advertising also serves a distinct purpose for advertisers relative to web display ads. Instream video ads tend to be more expensive to produce than static display advertisements, and because some ad networks and exchanges specialize in either instream video or static display ads, advertisers may need to use different channels to purchase video and display advertisements.

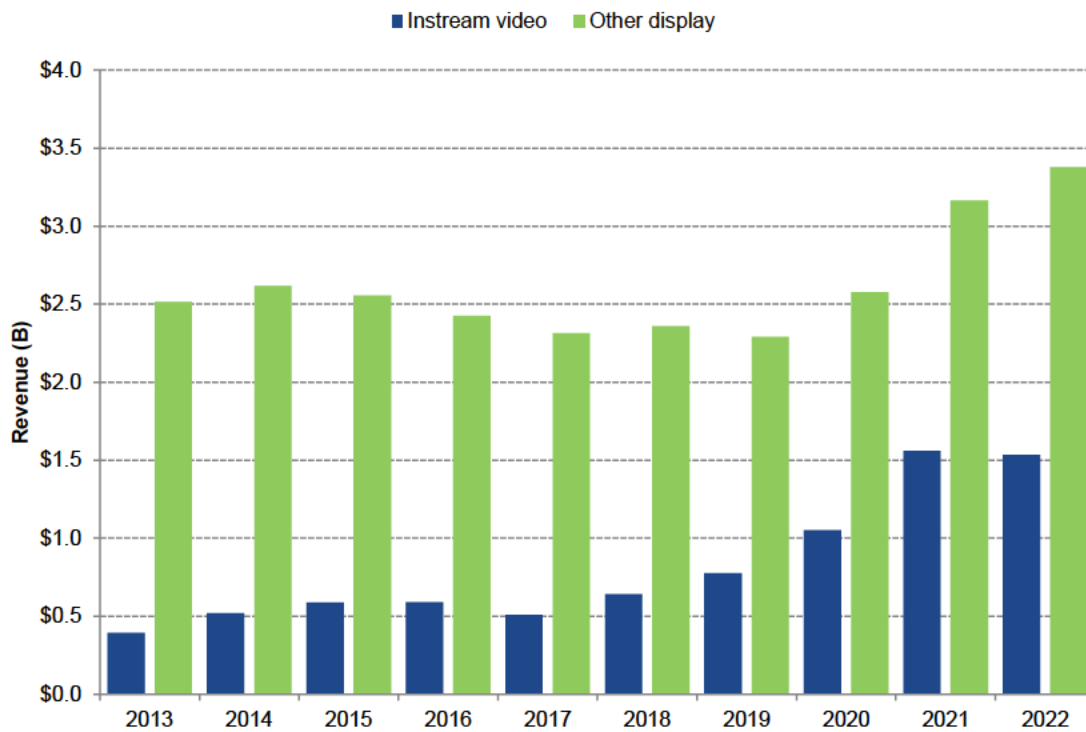
(162) In response, Dr. Israel claims that “[i]nstream video advertising offers another alternative to which advertisers could turn,” and that statistics that he presents “supports the conclusion that advertisers would shift spend to digital video advertising in response to a small but significant increase in the price of display advertising.”²⁷⁵ However, his analyses fail to support his opinion that the relevant markets “incorrectly excludes competition from properties using...instream video.”²⁷⁶

(163) First, Dr. Israel’s analysis that “instream video advertising has accounted for an increasing share of display ad spend on Google Ads” does not demonstrate that advertisers would substitute away from open-web display to instream video. Rather, in Figure 11, which converts Dr. Israel’s Figure 36 from percentages to dollars, it is clear that though Google Ads spending on instream video has grown, spending on other display has also grown. Growth in both segments is consistent with the notion that advertisers view both forms of advertising as distinct and valuable.

²⁷⁴ Lee Initial Report, ¶¶ 290–291.

²⁷⁵ Israel Report, ¶¶ 249, 252.

²⁷⁶ Israel Report, ¶ 218 (“Plaintiffs’ proposed market incorrectly excludes competition from properties using integrated advertising tools, in-app, instream video, and native advertising.”).

Figure 11. Google Ads US web display ad spending by instream video vs. other display (2013–2022)

Source: Backup materials for Israel Report, Figure 36: Google Ads data (DOJ RFP 7).

- (164) Second, Dr. Israel calculates that 64% of Google Ads advertiser spending is associated with advertisers who use both instream video and other display advertising, which is also consistent with both forms of advertising being valuable to advertisers. As noted above in IV.A.4, multihoming is not the same as substitution. However, Dr. Israel’s analysis also demonstrates that 36% of spend is associated with advertisers who *do not* multihome, and 32% of spend is associated with display-only advertisers who do not use instream video.²⁷⁷ In contrast, only 4% of spend is associated with advertisers who use only instream video.²⁷⁸ Such spending patterns do not necessarily indicate that advertisers would substitute away from open-web display to instream-video only in response to a price increase in *ad tech tools* (and not display advertising).
- (165) Last, Dr. Israel again points to purported “multi-homing” and “substitution” statistics in Prof. Simonson’s survey, but again neither support his assertion that advertisers view app inventory as a close substitute for web inventory.²⁷⁹ Rather, taken at face value they imply that approximately 35 to 46 percent of advertisers do not use video advertising at all, and that only 23 to 26 percent of

²⁷⁷ Israel Report, Figure 37.

²⁷⁸ Israel Report, Figure 37.

²⁷⁹ Israel Report, ¶¶ 251–252.

advertisers “would shift spend to digital video advertising.”²⁸⁰ And as Dr. Israel’s figures do not distinguish between instream and outstream video, these numbers may overstate the number of advertisers who use or would shift to instream video.²⁸¹

IV.B.2.c.iv. Native advertising

(166) In my initial report I explained that:²⁸²

Native advertising is also distinct from web display advertising from an advertiser’s perspective. Whereas traditional banner display ads are distinguishable from a publisher’s content, native ads are styled to blend into the format of a publisher’s site.

Native and display ads also differ in part due to constraints placed on ad formats. Native advertising inventory generally has inflexible sizes, formats, and page placement. Moreover, since native advertising is designed to blend in with organic site content, publishers may have strong brand safety standards and creative standards for native ads.

(167) I further described “three prominent forms of native ads: sponsored listing, social, and content recommendation” and explained that “each form is distinct from display advertising from an advertiser’s perspective.”²⁸³

- “*Sponsored Product* or *Sponsored Listing* ads promote specific products alongside ‘organic’ product listings on e-commerce sites within search results or in suggested product pages.”²⁸⁴ They “are typically shown on a retailer’s site, or on search or product listing pages, limiting the set of advertisers and publishers for whom such ads are appropriate.”²⁸⁵
- “*Social media* (or ‘in-feed social’) ads appear in social media feeds and closely resemble organic posts on those sites.”²⁸⁶ In my initial report I identified several examples of advertisers and Google distinguishing between social-in fee ads and open-web display.²⁸⁷ For example, one Google executive “testified that Google launched Discovery Ads”—its “product for ads placed on

²⁸⁰ Israel Report, ¶¶ 251 (“Prof. Simonson’s survey indicates that more than 50 percent of advertisers and agencies (and nearly two-thirds of higher-spend advertisers and agencies) that use open web display advertising also use digital video advertising”); 252, Figure 29, Figure 30. 23–26 percent is calculated by multiplying each percentage that “will divert spending” from Figure 29 by the corresponding “Digital Video” percentage in Figure 30.

²⁸¹ Israel Report, n. 284.

²⁸² Lee Initial Report, ¶ 294.

²⁸³ Lee Initial Report, ¶ 294.

²⁸⁴ Lee Initial Report, ¶ 49.

²⁸⁵ Lee Initial Report, ¶ 294.

²⁸⁶ Lee Initial Report, ¶ 49 (emphasis added).

²⁸⁷ Lee Initial Report, ¶¶ 294–296.

Google’s ‘O&O feed-like properties’—“because advertisers were asking why they could not get the types of social ads from Google that they could get from Facebook and Instagram.”²⁸⁸

- “*Content recommendation* ads are collections of links that suggest additional external content for users.”²⁸⁹ They “are considered by many industry participants to contain lower quality content than display ads” and “website operators tend to place these ad units at the bottom of their pages or prefer to not use them at all.”²⁹⁰ “Consistent with content recommendation appealing to different advertising needs and advertisers, a 2020 Google presentation noted that a challenge for its Matched Content product was a ‘lack of [content recommendation]-specific advertisers.’”²⁹¹

(168) Dr. Israel does not address any of these distinctions. Instead, he merely notes that some industry participants and documents do not distinguish between native ads and display ads, without addressing any of the documents or testimony I identify in my initial report that do distinguish between the two.²⁹²

(169) Nor does Dr. Israel present any evidence, or even offer a specific opinion, that advertisers would substitute to native ads from open-web display ads if they faced a price increase for open-web display advertising (let alone, a price increase for the underlying open-web display advertising tools). Instead, Dr. Israel asserts that “the arguments [he] discuss[es] about the competitive constraints that social ads impose on Google’s ad tech products also apply to any analysis of native ads, as the two categories are largely overlapping.”²⁹³ Dr. Israel does not identify any specific arguments to which he is referring, however to the extent he is using “social ads” to refer to social media properties using integrated advertising tools, I have addressed his arguments in Section IV.B.2.c.i.²⁹⁴

IV.B.3. Indirect transactions for open-web display advertising provide additional distinct value to publishers and advertisers

(170) As I discussed in my initial report, there are important distinctions between indirect and direct transactions for open-web display advertising from the perspective of publisher and advertisers.²⁹⁵ While advertisements sold through direct deals are often placed in premium ad slots and generally command higher prices than inventory sold indirectly, direct transactions typically require more effort

²⁸⁸ Lee Initial Report, ¶¶ 295–296

²⁸⁹ Lee Initial Report, ¶ 49.

²⁹⁰ Lee Initial Report, ¶ 49.

²⁹¹ Lee Initial Report, ¶ 297.

²⁹² Israel Report, ¶¶ 253–254.

²⁹³ Israel Report, ¶ 255.

²⁹⁴ See e.g., Israel Report, ¶¶ 165 (“social media advertising (which Plaintiffs refer to as part of the ‘closed web’ or ‘walled gardens’ or ‘applications or [...] websites using integrated advertising tools’); 218 (“I also observe that there is considerable overlap between these categories. For example, Instagram is part of a closed platform (Meta), generates most of its content in-app, and sells instream video and what Prof. Lee defines as native ads.”).

²⁹⁵ Lee Initial Report, Section IV.B.4.

to sell than indirect transactions, and only larger publishers and advertisers generally have personnel dedicated to direct sales.²⁹⁶ In contrast, indirect transactions allow publishers to fill their “remnant” inventory that may not easily be filled through direct deals.²⁹⁷ Indirect transactions also provide advertisers with additional supply of ad slots and allow advertisers to adjust their bids for ad inventory in real-time to “buy the ad space they value the most.”²⁹⁸ I showed in my initial report that from 2018–2022, roughly 85% of open-web display impressions through DFP were sold indirectly.²⁹⁹

- (171) Consistent with these differences, as I discussed in my initial report, publishers obtain CPM payouts for direct transactions that are on average six times higher or more than those they obtain for indirect ads.³⁰⁰ Such large price differences are consistent with direct and indirect channels not being close substitutes from a publisher’s perspective, since otherwise publishers would have a clear incentive to switch inventory from indirect to direct sales channels. Dr. Israel does not present any contrary evidence on this point.³⁰¹
- (172) Dr. Israel argues that I incorrectly exclude direct deals from the relevant markets I discuss and that by doing so I ignore a potentially important avenue of substitution.³⁰² He asserts that “direct sales (including the use of both programmatic and non-programmatic means) represent an important alternative through which advertisers and publishers can interact with each other”³⁰³ and that for publishers who make both indirect and direct sales, “an important dimension of substitution – managed in large part by the ad server – is deciding what inventory to sell directly and what inventory to sell indirectly.”³⁰⁴ He argues that even small publishers who do not sell ads directly are protected by this competition.³⁰⁵

²⁹⁶ See Lee Initial Report, Section IV.B.4. See also, Deposition of Ryan Pauley (Vox), August 23, 2023, 59:25–60:5 (“Direct display generally requires significant more effort and resourcing in order to sell. It generally is at a meaningfully higher price compared to the Open Auction.”).

²⁹⁷ Lee Initial Report, ¶¶ 309–311; See also, Ghose Report, ¶ 254.

²⁹⁸ Neal Mohan, “A year of the new DoubleClick Ad Exchange: improving large publishers’ returns,” Google Official Blog, (blog), January 16, 2011, <https://googleblog.blogspot.com/2011/01/year-of-new-doubleclick-ad-exchange.html>.

²⁹⁹ Lee Initial Report, Figure 31.

³⁰⁰ Lee Initial Report, Figure 32.

³⁰¹ Dr. Israel criticizes this price comparison for not focusing on the return on investment (ROI) that *advertisers* obtain from different ad channels. He misses the point of this comparison, which is that such a large price gap is inconsistent with close substitution from the *publisher’s* perspective, irrespective of advertiser incentives. Dr. Israel does not address the publisher perspective in his criticism on this point. See Israel Report, ¶ 180 (“Prof. Lee presents data showing that direct transactions on DFP yield higher prices (CPMs) than indirect transactions. But, for purposes of defining relevant markets in digital advertising, price (CPM) is the wrong metric to compare. This conclusion follows from the fact that advertisers care about the return on investment (ROI) that they earn on their advertiser expenditure.”). Dr. Israel is wrong and neglects the fact that *publishers* care about CPM payouts.

³⁰² See, e.g., Israel Report, ¶ 276 and § IV.D.2.

³⁰³ Israel Report, ¶ 277.

³⁰⁴ Israel Report, ¶ 280.

³⁰⁵ See, e.g., Israel Report, ¶ 280 (“Moreover, because competition occurs on the margins—meaning that prices are set to compete for those customers most likely to switch to another product—the fact that some publishers currently sell only indirectly does not imply that direct sales are not a viable substitute for indirect sales.”).

- (173) Here as elsewhere, as I discussed in Section IV.A.1 above, Dr. Israel focuses on the fact of substitution rather than whether that substitution is sufficient to prevent a hypothetical monopolist of a proposed relevant market from exercising market power. The evidence I discussed in my opening report indicates that it is not.³⁰⁶
- (174) In addition, it is important to note here again, as I did earlier in Section IV.B, that Dr. Israel does not clearly distinguish between advertising transaction types and the underlying tools used to sell advertising, and seems to equate substitution between forms of advertising transactions to substitution between the tools that facilitate those transactions. Publishers and advertisers rely on advertiser ad networks and exchanges to facilitate the sale of indirect open-web display advertising. Such tools can often be used to transact both indirect and direct open-web transactions. Even if there is some switching between indirect and direct sales, publishers and advertisers are still reliant on ad exchanges and other ad tech tools to sell their indirect impressions for which there are no direct deals.³⁰⁷
- (175) Dr. Israel makes two broad points in support of his claim that direct and indirect advertisements are close substitutes: 1) there are a substantial number of advertisers and publishers who use both direct and indirect methods of transacting ad inventory,³⁰⁸ and 2) advertisers may substitute on the margin from indirect to direct transactions based on performance.³⁰⁹ I address each of those points below.

³⁰⁶ See, e.g., Israel Report, ¶ 276 and § IV.D.2.

³⁰⁷ As support for his claim that limiting the relevant market to indirect transactions improperly excludes meaningful competition from direct transactions, Dr. Israel writes, “Plaintiffs’ expert Prof. Lee claims that, “[w]hile ad exchanges have begun to facilitate some direct transactions, such as Programmatic Guaranteed and Preferred Deals, the vast majority of transactions on exchanges are indirect, most often filled through RTB” (Lee Initial Report, n. 487). However, data from [REDACTED] indicate that much of its revenues are generated via ‘guaranteed’ channels (see [REDACTED]). Israel Report, n. 337. There are at least three issues with Dr. Israel’s statement. First, it is correct that the vast majority of transactions on exchanges are indirect, most often filled through RTB. See Lee Initial Report, n. 115. Second, [REDACTED] exchange data show that the vast majority of its transactions and spend are indirect. Data from [REDACTED] on ad spending through its exchange indicate that indirect transactions represent over 80% of its ad spending on open-web display impressions. Indeed, including direct transactions in its share calculation does not change meaningfully [REDACTED] share. [REDACTED] share of indirect open-web display impressions was 6.5% in 2022, while its share of indirect and direct open-web display impressions was 6.4% in 2022. See my backup materials. Third, Dr. Israel’s characterization that much of [REDACTED] revenues are generated via guaranteed channels is not supported by the document he cites. The document that Dr. Israel cites contains third party estimates of industry revenue—not [REDACTED] revenue, as Dr. Israel asserts. This is apparent in examining the total revenue in the file Dr. Israel relies on. This file contains over \$100 billion in ad spending in 2018, while the data that Israel relies upon for his estimate of [REDACTED] share in the ad exchange market contains a less than \$1 billion in 2018. See [REDACTED] [REDACTED] deck presents the same values that appear in [REDACTED] for open-auction RTB spending in 2015 and 2019, citing the source as “IDC Worldwide Digital Advertising Market Model, 1Q15,”).

³⁰⁸ Israel Report, Figures 20 and 21.

³⁰⁹ As I discussed in Section IV.A.3 above, advertiser substitution alone is not sufficient to conclude that a hypothetical monopolist could not profitably impose a SSNIP. In these arguments as well, Dr. Israel only focuses on advertisers and says nothing about publisher substitution.

IV.B.3.a. Advertiser and publisher use of both direct and indirect sales channels

- (176) With respect to the first point, as I explained above in Section IV.A.3, simply using two different sales channels does not equate to close substitution between them. In addition, Dr. Israel exaggerates the degree to which advertisers use both sales channels.
- (177) Dr. Israel shows in his Figures 20 and 21 that a significant number of advertisers, particularly large advertisers, purchase ads through both direct and indirect channels. In his Figure 21, he relies on survey results from Prof. Simonson's report that show that large advertisers and agencies are likely to purchase ads through both direct and indirect channels. I do not disagree, as I noted in my initial report, that large advertisers often purchase inventory through both direct and indirect channels as both provide unique benefits.³¹⁰ However, Dr. Israel does not highlight the significant percentage of large advertisers and agencies who rely only on indirect transactions for their ad spend. In his Figure 21, taking the survey results at face value, over 50% of agencies and 41% of large advertisers reported using only indirect transactions to purchase ad inventory.
- (178) Dr. Israel argues in response that "inframarginal" customers with fewer options are generally protected by customers on the margin, who put competitive pressure on firms to keep prices low for all customers.³¹¹ But Dr. Israel's claim fails to account for Google's ability to price discriminate with DFP, AdX, and Google Ads and, in some cases, vary fees at the publisher or impression level, which means that less price sensitive customers can be particularly targeted by exercises of market power regardless of the presence of more price sensitive customers on the margin.³¹²
- (179) A similar pattern is depicted in his Figure 20, which shows distribution of spend across all DV360 advertisers: close to 40% spend in 2022 was attributed to advertisers who use indirect means only to purchase ad inventory, while only 0.2% was attributed to advertisers who solely used Programmatic Direct transactions.
- (180) Dr. Israel's presentations in his Figure 20 and Figure 21 obscure the fact that even among large advertisers who are more likely to use both direct and indirect transactions, indirect transactions

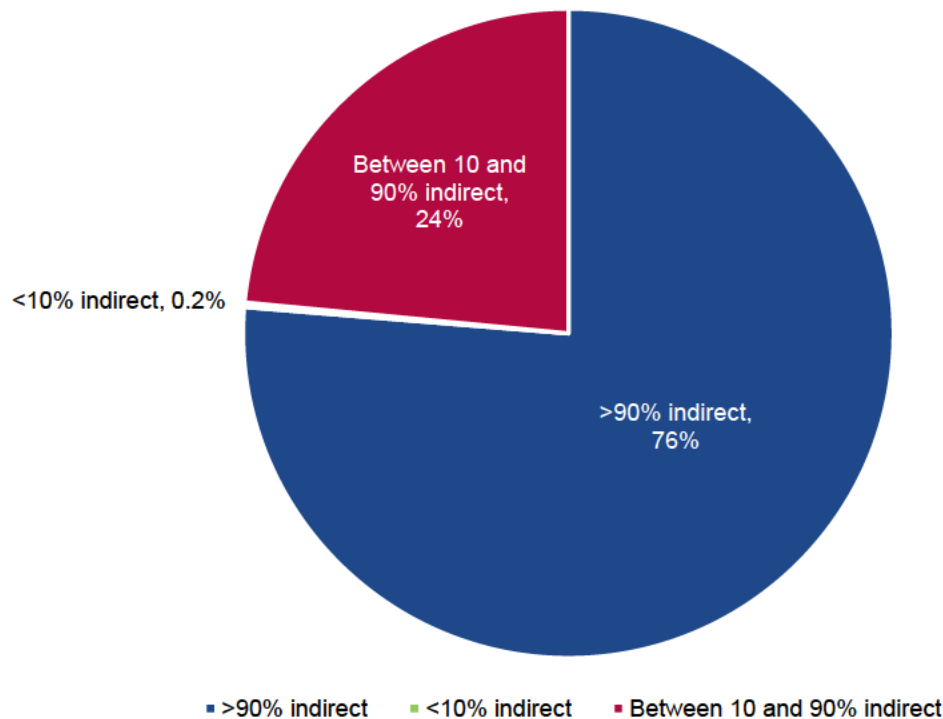
³¹⁰ Lee Initial Report, ¶ 312.

³¹¹ Israel Report, ¶¶ 280–281 ("Those customers who use both direct and indirect methods face low switching costs between the two and are therefore most likely to be the marginal customers that most influence the price (and quality)-setting process. There is nothing unusual about this point; in all markets there are some "inframarginal" customers who would not consider alternatives, but they are protected by those on the margin who put competitive pressure on the firms in question."). See also, Israel Report, ¶ 190.

³¹² Lee Initial Report, ¶¶ 402–403, 514, 539–542. In my initial report, I noted that, "Google's ability to engage in price discrimination and charge different prices to customers without being constrained by customer substitution implies that a hypothetical monopolist could also engage in a targeted exercise of market power over customers within a particular geographic region." (Lee Initial Report, ¶ 403). See also, Hal R. Varian, *Intermediate Microeconomics: A Modern Approach*, 9th ed. (New York: W. W. Norton & Company, 2014), 488 ("[T]he market with the higher price must have the lower elasticity of demand. Upon reflection, this is quite sensible. An elastic demand is a price-sensitive demand. A firm that price discriminates will therefore set a low price for the price-sensitive group and a high price for the group that is relatively price insensitive. In this way it maximizes its overall profits.").

represent a substantial share of spending that may not be easily substituted for by direct deals. Figure 12 below plots Dr. Israel's Figure 20 by advertisers' share of spending on indirect transactions. Advertisers who allocated more than 90% of their spending on DV360 to indirect transactions represented over 75% of spending on DV360 in 2022.³¹³

Figure 12. Distribution of DV360 US web non-video display ad spending by share of advertiser spend on indirect transactions (2022)



Source: Backup materials for Israel Report, Figure 20: DV360 XBridge data (DOJ RFP 7)

Notes: The data are limited to web non-video display impressions.

IV.B.3.b. Evidence of advertiser and publisher substitution between direct and indirect channels

- (181) Dr. Israel argues that “advertisers and/or their agencies can specifically shift spending between indirect and direct channels based on their performance,” purporting to show documentary evidence of advertisers allocating spend between transaction types.³¹⁴ However, his evidence here shows that advertisers view direct and indirect transactions as serving different purposes, with direct transactions

³¹³ See Figure 68 in Appendix B for the distribution of DV360 worldwide web non-video display ad spending. Advertisers who allocated more than 90% of their spending on DV360 to indirect transactions represented 56% of spending on DV360 in 2022. Advertisers who allocated between 10 and 90%, inclusive, represented 43% of spending (18% of spending is associated with advertisers who allocated between 80 and 90%, inclusive).

³¹⁴ Israel Report, ¶ 213.

being primarily used for premium inventory.³¹⁵ As I show in my initial report, even if there may be some substitution between direct and indirect transactions for advertisers, testimony from industry participants supports the idea that it is difficult to shift significant demand between indirect and direct advertising in response to relative price movements.³¹⁶

- (182) As additional evidence of advertiser and publisher substitution between direct and indirect deals, Dr. Israel proposes examining the “natural experiment” of the deprecation of third-party cookies.³¹⁷ Specifically, he states “the deprecation of third-party cookies has led advertisers (and publishers) to substitute from indirect purchases (and open auction purchases specifically) to direct deals.”³¹⁸ In support of this point he cites a news article, but provides no empirical evidence that either advertisers or publishers actually substituted meaningfully between these transaction types in response to cookie deprecation. Figures 16 and 31 of my initial report show, in contrast, that the share of both spend and impressions attributed to indirect deals for DFP has remained stable between 2018 and 2022. And even if advertisers or publishers did switch meaningfully in response to a cookie deprecation, this may not be informative of the response to a small but significant increase in price of ad tech products relative to competitive levels, since a one-time cookie deprecation may be equivalent to a much greater price increase (and is measured at potentially elevated levels).
- (183) Finally, even if one were to ignore the clear evidence that indirect transactions provide distinct value to advertisers and publishers and direct transactions are not close enough substitutes to discipline an exercise of market power, the inclusion of programmatic direct transactions does not meaningfully

³¹⁵

[REDACTED]

³¹⁶ See e.g., Deposition of Ryan Pauley (Vox), August 23, 2023, 65:25–66:13 ([Given an increase in take rates on OA transactions], “it would be very difficult to transition any demand to—from open to direct.”); Deposition of Krishan Bhatia (Comcast/NBC), Sep. 21, 2023, 167:23-169:4 (“Q. If the cost to purchase display advertising through indirect channels increased substantially, would advertisers attempt to shift their spending from purchasing indirectly to purchasing directly from NBCU?...[A:] I think that depends. I think pricing is only one consideration why one buys direct versus indirect...It depends on the priorities of the advertiser. If the advertiser is looking to spend a smaller budget across a larger group of publishers and employ targeting at scale, programmatic is likely their preferred method. If a publi- -- if a marketer is looking to align themselves with a larger budget specifically to, in this case an NBCUniversal property through a sponsorship or a share of voice, by -- then a direct way of buying would be the preferred method.”).

³¹⁷ Third-party cookies are the technology that enables cross-site tracking on the web. Third-party cookie deprecation decreases the value of many indirect open-web display impressions because it decreases the amount of tracking information available to advertisers. As Dr. Israel explains, “policies that restrict the use of third-party cookies decrease the quality of open auction purchases of advertising inventory.” Israel Report, ¶ 212. See also, Google, “Preparing for the end of third-party cookies,” *Privacy Sandbox*, October 11, 2023, <https://developers.google.com/privacy-sandbox/blog/cookie-countdown-2023oct>.

³¹⁸ Israel Report, ¶¶ 212, 284.

affect my calculations of market shares in either the advertiser ad network or exchange markets, as I show in Sections IV.D.2 and IV.E.2 below.³¹⁹

IV.C. Publisher ad servers is a relevant product market

- (184) In my initial report, I discussed why publisher ad servers that can be used to serve or transact open-web display advertising (henceforth, “publisher ad servers”) are a relevant antitrust product market and useful for analyzing Google’s scrutinized conduct.³²⁰
- (185) Publisher ad servers are software products that can be used to manage and sell both direct and indirect display advertising across web properties. These products allow publishers to set rules to manage different transactions types in real-time (i.e., implementing “decision logic” on behalf of publishers), and provide other features including collecting and utilizing targeting information and tracking ad performance.³²¹ Publisher ad servers are particularly important for publishers with more complex display advertising needs, including those seeking to meet the pricing and scheduling requirements of direct deals while also allocating inventory via RTB.³²²
- (186) Moreover, a firm possessing substantial and sustained market power over publisher ad servers, protected by significant barriers to entry, would be able to engage in conduct harming competition among publisher ad servers as well as among other ad tech products, including ad exchanges. Indeed, numerous Google documents have emphasized the strategic importance of its DFP product and have specifically called out the important role played by publisher ad servers in the ad tech stack.³²³ By controlling what Google documents have referred to as the ad serving “decision engine,” Google can lock in customers and enhance its market power across the ad tech stack.³²⁴
- (187) Despite the evidence to the contrary, Dr. Israel claims that publisher ad servers do not “constitute a well-defined antitrust market,” arguing that because publishers have “alternative options [that] do function in somewhat different ways” to third-party publisher ad servers, a market for publisher ad servers for open web display advertising “defines away healthy competition that exists.”³²⁵ He claims

³¹⁹ As I show in Section IV.D.2, including programmatic direct transactions in my calculation of exchange shares decreases AdX’s share by roughly one percentage point in 2022 (see my backup materials). As I show in Section IV.E.2, doing the same for the advertiser ad network market changes Google Ads’ share by less than one percentage point (see my backup materials). The shares I calculated in my initial report for the publisher ad server market included both direct and indirect transactions as a publisher ad server needs to be able to serve both forms of advertisements (*see* Lee Initial Report, § V.B.2).

³²⁰ Lee Initial Report, § IV.C.

³²¹ Lee Initial Report, ¶ 316.

³²² Lee Initial Report, ¶ 316.

³²³ Lee Initial Report, § VII.A.1.

³²⁴ Lee Initial Report, ¶ 587.

³²⁵ Israel Report, § IV.E, ¶ 297.

that web publishers’ abilities to substitute to in-app content and to “in-house” servers “impose important competitive constraints on DFP.”³²⁶

- (188) In this Section, I discuss why Dr. Israel’s arguments regarding these potential substitutes are insufficient to support his claim that a market for publisher ad servers is not well-defined. I also discuss why Dr. Israel’s alternative market share calculations that include transactions from publishers with integrated ad servers (Meta, Pinterest, Snapchat, and TikTok), and from transactions from app mediation platforms and exchanges, are not appropriate for evaluating the market power of Google’s DFP publisher ad server.

IV.C.1. Dr. Israel’s analysis fails to demonstrate that publisher ad servers is not a relevant product market

- (189) In arguing that publisher ad servers does not constitute a properly defined market, Dr. Israel presents two alternatives to publisher ad servers that that he claims “impose important competitive constraints on DFP”: open-web publishers could shift more content and usage from web to other formats (in particular, in-app content), or open-web publishers could build their own publisher ad servers.³²⁷ The arguments that he provides are insufficient to support his claim that publisher ad servers are not a well-defined relevant product market.
- (190) First and foremost, the presence of potential substitutes for some customers outside of the relevant market does not necessarily invalidate that market. The relevant criterion for whether potential alternatives are close enough substitutes to warrant inclusion is whether they would impose a sufficient competitive discipline to prevent a hypothetical monopolist of publisher ad servers for open-web display advertising from exercising market power over competitive levels (see Section IV.A.1 above).
- (191) Second, Dr. Israel fails to address direct evidence of DFP’s market power, which on its own strongly supports the existence of a relevant publisher ad server market: if Google is able to exercise significant market power with DFP, a hypothetical monopolist controlling DFP and additional products would be able to do so as well.³²⁸ Direct evidence includes Google’s own internal analyses indicating publishers’ limited ability to substitute away from DFP in the event of a price increase.³²⁹
- (192) With respect to Dr. Israel’s specific alternatives, I explained in my initial report why these particular substitutes (and others) are not likely close enough substitutes to constrain the exercise of market

³²⁶ Israel Report, ¶ 297.

³²⁷ Israel Report, ¶ 297.

³²⁸ Lee Initial Report, § V.B.3. In n. 357, Dr. Israel claims to address direct evidence of DFP’s market power in Sections VIII.A.2 (pricing) and VIII.D (conduct) of his report. However, as I discuss below in Section V.B, despite this claim, he does not rebut much of the direct evidence presented regarding DFP’s substantial market power.

³²⁹ Lee Initial Report, ¶ 458.

power by a hypothetical monopolist of publisher ad servers.³³⁰ Dr. Israel largely does not address the evidence I presented in my opening report on these points.³³¹ Nor does he explain why publishers' content provision strategies or decisions to build their own server would be sensitive enough to ad serving fees such that they would constrain a hypothetical monopolist of publisher ad servers from exercising market power.³³²

- (193) Below I review the arguments and evidence presented by Dr. Israel and discuss why they do not alter my opinion that publisher ad servers is a relevant product market.

IV.C.1.a. Web publishers shifting content or users to mobile applications is not sufficient to defeat an exercise of market power by a hypothetical monopolist of publisher ad servers

- (194) In my initial report, I noted that a web publisher's options for using advertising is limited by the nature of the content that it offers.³³³ In particular, even if a web publisher has a mobile application, it is not the case that the publisher could use in-app display ads to monetize its web inventory—a given display impression is either web or in-app.
- (195) However, Dr. Israel argues that open-web publishers “have options that include focusing more attention on other formats for content, including app-based options” to shift user behavior.³³⁴ Setting aside substantial direct evidence that DFP has and is already exercising significant market power despite these options (thereby supporting a publisher ad server market that contains DFP), there are several additional reasons why Dr. Israel's argument does not invalidate a publisher ad server market.
- (196) First, Dr. Israel ignores that products within the publisher ad server market also serve in-app ads. A product is contained in the publisher ad server market if it can serve open-web display ads; products,

³³⁰ Lee Initial Report, § IV.C.1.

³³¹ Lee Initial Report, ¶¶ 458–459. As noted in my initial report, a 2019 Google document stated that the “market [would] bear” a 10% increase in DFP's price (GOOG-DOJ-09712720, at -809 (08/07/2019)). In addition, a 2018 Google document stated that “[r]ais[ing] DFP serving fee ~20%” without changing AdX's price would lead to an increase in net revenue by \$40-\$50 million (GOOG-TEX-00124787, at -798 (07/09/2018)). As far back as 2010, Google noted that DFP's rate card was 50-100% higher than competitors in the US and that “customers are willing to pay a premium for DFP” (GOOG-AT-MDL-B-000030077, at -084, -089 (05/13/2010)).

³³² Indeed, Google's counsel during its DoubleClick Acquisition submitted a letter to the FTC that stated, “As a Matter of Commercial Reality, the Cost of Ad Serving Does Not Affect a Publisher's Inventory Allocation Decision... the price of publisher-side ad serving [] is a tiny fraction of the price the publisher receives for ad space... To take a concrete example, suppose a publisher paid 4 cents per thousand impressions in ad serving fees and generated \$2 per thousand impressions on the sale of its ad space, netting \$1.96 per thousand impressions after paying its ad server. If ad serving fees increased by 5% to 4.2 cents per thousand impressions, the publishers' net revenue on the space would drop by .1% from \$1.96 to \$1.958. This .1% change is a small and *insignificant* change in the net revenue from the ad space.” FTC_US-GOOGLE-000004694 at -697(8/9/2007).(FTC_US-GOOGLE-000004694, at -697, (8/9/2007)). (Dr. Israel also uses a \$2 per thousand impression revenue figure in his analysis of the cost of building a publisher ad server, Israel Report, ¶ 311). Although the letter was discussing substitution between DFP and AdSense, its assertion that publisher ad server costs “do[] not affect a publisher's revenue-driven decision as to how to allocate its inventory” is at odds with Dr. Israel's claims. (FTC_US-GOOGLE-000004694 at -698 (8/9/2007)).

³³³ Lee Initial Report, § IV.B.1.a.

³³⁴ Israel Report, ¶ 298.

- (229) Below I discuss why Dr. Israel's arguments are insufficient to support his claim that a market for ad exchanges is not well-defined. I also describe why Dr. Israel's alternative market share calculations for ad exchanges are not appropriate for evaluating Google's market power with its AdX ad exchange.

IV.D.1. Dr. Israel's analysis fails to demonstrate that ad exchanges is not a relevant product market

- (230) Dr. Israel claims that ad exchanges do not "constitute a well-defined antitrust product market."³⁷⁴ Dr. Israel's primary argument is that "exchanges must compete with any option that connects buyers and sellers" and that these options would constrain an exercise of market power that market.³⁷⁵ He notes that "direct deals between advertisers and publishers provide one important example of such an alternative."³⁷⁶ He also lists options that sell forms of advertising other than open-web display as constraints on exchanges that transact open-web display advertising.³⁷⁷ Though he points to "any option to connect buyers and sellers" as a constraint on ad exchanges, he does not discuss alternative ad tech products that connect advertisers and publishers directly when specifically addressing the validity of an ad exchange market; rather, he discusses those products in his broader critique of "component specific" markets, which resides in a different section of his report.³⁷⁸ I respond to that broader critique in Section IV.F.2 below.
- (231) As I noted above in the case of the publisher ad server market, the presence of potential substitutes for some customers outside of a relevant market does not necessarily invalidate that market. In this case, the relevant criterion for whether potential alternatives are close enough substitutes to warrant inclusion is whether they would impose a sufficient competitive discipline to prevent a hypothetical monopolist of ad exchanges for open-web display advertising from exercising market power over competitive levels.³⁷⁹ Dr. Israel presents no evidence that a monopolist would be constrained in this fashion by his purported alternatives. Moreover, Dr. Israel fails to address much of the direct evidence I presented of AdX's market power, which on its own strongly supports the existence of an ad exchange market.³⁸⁰

³⁷⁴ Israel Report, § IV.D (Plaintiffs' Alleged "Ad Exchanges for Indirect Open Web Display Advertising" Market Does Not Constitute a Well-Defined Antitrust Product Market).

³⁷⁵ Israel Report, ¶ 269.

³⁷⁶ Israel Report, ¶ 269.

³⁷⁷ Israel Report, ¶ 269.

³⁷⁸ Israel Report, § IV.F.

³⁷⁹ See discussion in Section IV.A.1 above.

³⁸⁰ Lee Initial Report, § V.B.3. In n. 357, Dr. Israel claims to address direct evidence of AdX's market power in Sections VIII.A.2 (pricing) and VIII.D (conduct) of his report. However, as I discuss below in Section V.C, despite this claim, he does not rebut much of the direct evidence presented regarding AdX's substantial market power.

Figure 13. Lee and Israel estimates of AdX market shares among ad exchanges using Google and third-party data (2019–2022)

Geography	Metric	Lee				Israel			
		2019	2020	2021	2022	2019	2020	2021	2022
Worldwide	Impressions	60%	66%	60%	57%	Does not include	Does not include	Does not include	Does not include
	Fees	52%	51%	48%	44%	Does not include	Does not include	Does not include	Does not include
	Spend	49%	48%	44%	40%	Does not include	Does not include	Does not include	Does not include
United States	Impressions	48%	56%	51%	47%	Does not include	Does not include	Does not include	Does not include
	Fees	45%	45%	41%	37%	Does not include	Does not include	Does not include	Does not include
	Spend	43%	43%	39%	34%	43%	42%	41%	38%

Source: Backup materials for Lee Initial Report: Exchange panel; Backup materials for Israel Report, Figure 41: Israel exchange panel (see Appendix B).

Notes: Dr. Israel stated in his report that his “conclusions that Google lacks monopoly power and that its challenged conduct has not harmed competition do not depend on whether the relevant geographic market is the United States or worldwide” and that his “backup materials contain key empirical results demonstrating that all [his] conclusions hold in a worldwide geographic market.”). Israel Report, ¶ 374. However, Dr. Israel’s backup materials do not contain estimates of worldwide market shares using Google and third-party data.

(245) Dr. Israel also presents an estimate of AdX’s market share based on data from the internet security company Confiant. He finds that according to this source, AdX’s impression share is much lower than he reports from other sources, with AdX comprising “less than 30% of Confiant-monitored impressions.”³⁹⁹ However, these transactions are not limited to display advertising, and so do not correspond to any market that either Dr. Israel or I define. In addition, these market shares are also unlikely to be representative of AdX’s market share in the ad exchange market for other reasons:

- They are computed for a small sample of publishers that have chosen to use Confiant’s services.⁴⁰⁰ These publishers account for less than 10% of the volume of impressions in my exchange data.⁴⁰¹

(“SSPs”) and ad networks.”). By including transactions from products that are not contained within the ad exchange market, Dr. Israel’s shares based on indirect transactions within DFP do not represent AdX’s share of ad exchange impressions. Dr. Israel’s claim that the use of DFP in the denominator “likely overstates AdX’s share because it does not include any impressions served by non-Google ad servers” is also thus incorrect (Israel Report, ¶ 271).

³⁹⁹ Israel Report, ¶ 273.

⁴⁰⁰ Moreover, shares in the Confiant data are sensitive to the inclusion of particular publishers. For example, removing the largest publisher increases Google’s share by as much as 5.7 percentage points (Israel Report backup materials).

⁴⁰¹ To approximate the market served by Confiant, I exclude owned-and-operated inventory from my exchange panel for purposes of this comparison. To be conservative, I also limit to US users in making this comparison.

when programmatic direct and programmatic guaranteed transactions through ad exchanges are included.⁴⁰⁶

- (249) Second, in his Figure 48, Dr. Israel also calculates Google's share of spending among "all US display advertising," using as a numerator spending on Google's AdX, AdSense, AdMob, YouTube, and "other Google O&O display," and using as a denominator total "display" ad spending from eMarketer, which includes spending on social media, instream video, and in-app advertising.⁴⁰⁷ Both the numerator and denominator include transactions from products that do not compete with AdX in the market for open-web display advertising. For instance, eMarketer includes display ad spending from ads such as Facebook's News Feed Ads and Twitter's Promoted Tweets.
- (250) The fundamental problem with this share calculation, as discussed above (see also discussion in Section IV.C.2), is that these market shares are computed for a set of products that no one, including Dr. Israel, has argued is a relevant product market appropriate for evaluating the conduct in question. Hence, these shares are also not informative for an assessment of Google's market power.

IV.E. Advertiser ad networks is a relevant product market

- (251) In my initial report, I discussed why advertiser ad networks that can be used to transact open-web display advertising (henceforth "advertiser ad networks") is an appropriate relevant antitrust market for analyzing the conduct at issue in this matter.⁴⁰⁸ As I discussed in that report, advertiser ad networks are distinct from other advertiser bidding tools that transact open-web display advertising, such as DSPs, in their functionality, the inventory they access, and their pricing models.⁴⁰⁹ In addition, a variety of evidence demonstrates that Google Ads can exercise substantial market power, which supports the notion that it is not constrained by competitors outside of the advertiser ad network market.⁴¹⁰

⁴⁰⁶ See my backup materials.

⁴⁰⁷ Israel Report, ¶ 289. eMarketer is a market research company that provides estimates of ad spending based on historical trends, reported revenues from major ad publishers, estimates from other research firms, and other data sources. The eMarketer estimate of "display" ad spending, which Dr. Israel uses as his denominator for his Figure 48, includes spending on advertising outside of the indirect open-web display market, including instream video and native advertising. GOOG-AT-DOJ-DATA-000066787 (eMarketer data).

⁴⁰⁸ Lee Initial Report, § IV.E.

⁴⁰⁹ Lee Initial Report, § IV.E.. *See also*, GOOG-DOJ-AT-00312340, at -343 (03/25/2020) (Noting that "Google Ads full automation" is "not what large advertisers need/desire (they want transparency, control)").

⁴¹⁰ Lee Initial Report, § V.D.3.

constrain the market power of a hypothetical monopolist over ad exchanges. In addition, as I showed in my initial report, including some of these products in share calculations does not change market shares meaningfully.⁵²⁴

- (338) Dr. Israel also mentions Criteo's Direct Bidder, Criteo's header bidding product launched in May 2017, and Mediavine's direct integration with Centro's Basis DSP, established in July 2020 as alternative "paths" for buyers and sellers that constrain an exercise of market power in ad exchanges. Both of these products also do not have the adoption necessary to constrain an exercise of market power in ad exchanges. As shown in Figure 33 in Section V.D.1, Criteo's Direct Bidder receives a miniscule fraction of the revenue that Google AdX receives. In addition, Mediavine CEO Eric Hochberger testified that its direct integration with DSPs is exclusively available to Mediavine publishers, and, thus, is not an option for the vast majority of publishers.⁵²⁵

IV.E.5. Dr. Ghose's discussion of "alternative pathways and tools" obscures the central role played by publisher ad servers, ad exchanges, and advertiser ad networks

- (339) Dr. Ghose argues that "[c]ontrary to the picture painted by Plaintiffs' experts, display ads can be transacted through many pathways and tools"⁵²⁶ and that "[p]laintiffs ignore years of evolution in ad tech that has enabled publishers and advertisers to select permutations of direct or indirect display ad transactions, involving one or more internally developed or externally sourced ad tech tools."⁵²⁷
- (340) In support of this argument, Dr. Ghose presents his Table 1, reproduced below, which lists nine pathways available to connect publishers and advertisers for display ad transactions. He claims that of the nine paths listed in the table, "Path 5 is one of the few pathways that Plaintiffs focus on."⁵²⁸

TV buys to programmatic model."). *See also* GOOG-AT-MDL-010373135, at -136 (05/19/2023) ("Magnite Clearline claims to offer a direct path for brands to video inventory, skipping the DSP, FW tech is not advanced enough to accommodate this. They have no direct seats right now. This is a vision for them but not confidence on whether they could execute."); ADFORM-001835, at -884 (05/2023) ("The value added by the DSP far outweigh any immediate cost savings that initially make these setups appealing for the vast majority of use cases.").

⁵²⁴ *See* Lee Initial Report, Figure 88 and Figure 89. Including transactions from DSPs connecting directly to publisher ad servers, AdX maintained between a 53% and 63% share of worldwide impressions and between a 42% and 48% share of worldwide fees between 2018 and 2022. Limited to transactions served to users in the United States, AdX's share of impressions was between 46% and 54% and its share of fees was between 36% and 43% between 2018 and 2022.

⁵²⁵ Deposition of Eric Hochberger (Mediavine), September 22, 2023, 39:17–40:7 ("Q. Does Mediavine have its own ad exchange? A. We do have some direct integrations with demand side platforms. So you could look at it as an exchange. But it is exclusively for our own publishers. So I don't think that term would commonly be used. Q. So it's only for owned and operated publishers. Is that what you're saying? A. Or publishers that we are -- do full service ad management. In which case, in our industry, we are looked at as the supplier, the publishing side. So you wouldn't look at it as an ad exchange in our industry.").

⁵²⁶ Ghose Report, ¶ 233.

⁵²⁷ Ghose Report, ¶ 233.

⁵²⁸ Ghose Report, ¶ 239.

Figure 20. Reproduction of Dr. Ghose's Table 1**Table 1. Examples of Different Pathways of Display Ad Transactions**

1	Advertiser	Self-Service Platform*			Publisher
2	Advertiser	Publisher Ad Server [<i>Direct Deals</i>]**			Publisher
3	Advertiser	Ad Network*			Publisher
4	Advertiser	Ad Network		Publisher Ad Server	Publisher
5	Advertiser	DSP / Ad Network	Ad Exchange / SSP	Publisher Ad Server	Publisher
6	Advertiser	DSP / Ad Network	Ad Exchange / SSP through Header Bidding	Publisher Ad Server	Publisher
7	Advertiser	DSP / Ad Network	Ad Exchange / SSP*		Publisher
8	Advertiser	Supply Path Optimization with Ad Exchange / SSP		Publisher Ad Server	Publisher
9	Advertiser	Supply Path Optimization with DSP		Publisher Ad Server	Publisher

* In the case of this transaction path, this tool would also perform the ad serving function.

** In some cases, this path can also involve negotiation that takes place via a DSP and SSP.

- (341) Contrary to his interpretation, Dr. Ghose's Table 1 highlights the indispensable role that products contained in the three relevant product markets play in facilitating connections between open-web advertisers and publishers. Indeed, publisher ad servers, ad exchanges, and advertiser ad networks are central to eight of the nine paths highlighted by Dr. Ghose. Figure 21 below reproduces Prof. Ghose's Table 1, but highlights the publisher ad server (in blue), ad exchange (in orange) and advertiser ad network (in green) products. This view of Dr. Ghose's table makes clear that only one of the nine pathways avoids the three product markets I discuss in my report: Path 1. That path, which represents integrated in-house ad tech tools such as those of Meta and TikTok,⁵²⁹ contains "self-service" products that are properly excluded from open-web display advertising markets for reasons I discussed in Section IV.B above.

⁵²⁹ Ghose Report, ¶ 234 ("Path 1 represents self-service platforms, which are in-house ad tech tools that allow advertisers to buy impressions directly from publishers running owned-and-operated platforms.").

Figure 21. Illustration of role of publisher ad servers, ad exchanges, and advertiser ad networks in connecting advertisers and publishers**Table 1. Examples of Different Pathways of Display Ad Transactions**

1	Advertiser	Self-Service Platform*			Publisher
2	Advertiser	Publisher Ad Server [<i>Direct Deals</i>]**			Publisher
3	Advertiser	Ad Network*			Publisher
4	Advertiser	Ad Network		Publisher Ad Server	Publisher
5	Advertiser	DSP / Ad Network	Ad Exchange / SSP	Publisher Ad Server	Publisher
6	Advertiser	DSP / Ad Network	Ad Exchange / SSP through Header Bidding	Publisher Ad Server	Publisher
7	Advertiser	DSP / Ad Network	Ad Exchange / SSP*		Publisher
8	Advertiser	Supply Path Optimization with Ad Exchange / SSP		Publisher Ad Server	Publisher
9	Advertiser	Supply Path Optimization with DSP		Publisher Ad Server	Publisher

* In the case of this transaction path, this tool would also perform the ad serving function.

** In some cases, this path can also involve negotiation that takes place via a DSP and SSP.

IV.F. Relevant geographic markets for publisher ad servers, ad exchanges, and advertiser ad networks

(342) In my initial report, I described why the United States is a relevant geographic market for all three relevant product markets.⁵³⁰

⁵³⁰ Lee Initial Report, § IV.F.2. There, I noted that a hypothetical monopolist of each relevant product market would likely be able to profitably exercise market power over all advertiser and open-web publisher customers within the United States without being constrained by pricing for customers located outside of the United States. Moreover, the competitive effects of Google's conduct are likely to be particularly meaningful within the US: a meaningful share of Google's revenues and those from other parties from open-web display advertising originate from customers within the US.

- (343) I also discussed why the entire world, excluding a limited number of regions (henceforth, “worldwide”) is a relevant geographic market for all three relevant product markets.⁵³¹ I provided three reasons why worldwide is an appropriate geographic market for evaluating Google’s market power in the relevant product markets and the competitive effects of its conduct:
- 1. Customers of all three relevant product markets (advertisers and open-web publishers) are located worldwide, and transact across country and region boundaries.
 - 2. “Supply-side” competition among ad tech providers is global: the major competitors in each relevant product market serve customers across multiple countries, and scale effects are not contained within country-specific boundaries. For example, an ad tech product with greater publisher inventory across different countries likely is better able to offer advertisers the ability to target and access users that visit those publishers than one confined to a single country.
 - 3. Google’s conduct that I evaluate in this report is not limited to the boundaries of any one country. Google has imposed restrictions on the use of its Google Ads, ADX, and DFP products by open-web publishers and advertisers located worldwide. Hence, the competitive effects of Google’s conduct extend beyond any individual country’s borders.
- (344) Even though both worldwide and the United States fulfill the criteria for being relevant geographic markets, as I noted in my initial report,⁵³²
- (345) The ad tech industry and scope of Google’s conduct is [] global. Although there may be some differences in competitive conditions within narrower geographic regions, there are compelling benefits to examining the whole world when examining the competitive significance and effects of Google’s conduct within the relevant product markets.
- (346) Hence, to obtain a complete picture of the scope and impact of Google’s conduct, it is important to consider its market power and outcomes outside the boundaries of a single country.

IV.F.1. Dr. Israel incorrectly dismisses the appropriateness of a worldwide geographic market

- (347) Dr. Israel disputes the appropriateness of analyzing a worldwide market, arguing that “it is more appropriate to assess competition and the effects of Google’s challenged conduct in a geographic market limited to the United States.”⁵³³ He opines that although a worldwide market would pass a hypothetical monopolist test if a US market did, it is only appropriate to analyze a worldwide market

⁵³¹ Lee Initial Report, § IV.F.1. Moreover, I describe why the exclusion of a small number of regions where Google has limited presence or is restricted from operating in due to US sanctions does not prevent a hypothetical monopolist from profitably exercising market power.

⁵³² Lee Initial Report, ¶ 389.

⁵³³ Israel Report, ¶ 49.

if “data from the rest of the world – market share data more specifically – are informative when analyzing competition in the United States.”⁵³⁴ He argues that differences in competitive conditions across countries as well as differences in regulatory regimes mean that shares in other countries are not informative about competition in the United States.⁵³⁵

- (348) Dr. Israel is incorrect to assert that “it is appropriate to expand the market” based solely on the informativeness of market share data. Notably, Dr. Israel ignores and does not address the three reasons described above and discussed in my initial report for the appropriateness of analyzing a worldwide market.
- (349) Moreover, geographic markets are generally defined based on the location of suppliers or the location of customers.⁵³⁶ I argued that a market based on the location of customers – that is, the advertisers and publishers that purchase the ad tech tools at issue – is appropriate for analyzing the conduct in this matter.⁵³⁷ One difficulty that presents itself in calculating shares in a US market is that the location of advertisers and publishers is not always clear from the data.⁵³⁸ In these cases, I used ad impressions served to US viewers as way to examine an ad tech product’s attractiveness to customers located in the US.⁵³⁹ Dr. Israel does not discuss whose location he is basing his market on – suppliers, customers, or viewers of advertisements – and he presents no rationale for which type of location he restricts a given analysis to.⁵⁴⁰
- (350) By Dr. Israel’s own criterion – that worldwide data are informative when analyzing competition in the United States – it is appropriate to evaluate a worldwide market in this matter. As I discussed in my initial report, scale, as measured by number of impressions, is important in ad tech products for a variety of reasons, including allowing them to operate more cost efficiently, and because additional

⁵³⁴ Israel Report, ¶ 365.

⁵³⁵ See, e.g., Israel Report, ¶ 365 (“But whether it is appropriate to expand the market in this way depends on whether data from the rest of the world—market share data more specifically—are informative when analyzing competition from the United States (or, more generally, whether shares from one country are informative about competition in another country).”); ¶ 367 (“in this case, the evidence clearly indicates that competitive conditions vary significantly across geographies.”); ¶ 371 (“Hence, differences in competitive conditions between the United States and Europe likely reflect, at least in part, substantially different regulatory conditions, a situation in which a worldwide market is likely to be inappropriate.”).

⁵³⁶ Lee Initial Report, ¶ 387.

⁵³⁷ Lee Initial Report, ¶ 387 (“A relevant geographic market can be based on the locations of customers (buyers or sellers of open- web display advertising). In this report, I focus on geographic market definition based on customer location—i.e., where open-web publishers and advertisers are located—and do not place restrictions on the location of suppliers.”).

⁵³⁸ Lee Initial Report, ¶ 486 (“Due to data limitations, I am unable to compute reliable ad exchange market shares based on transactions restricted to ad exchange customer locations—i.e., based on transactions involving US open-web publishers or US advertisers. However, I am able to present market shares based on *user locations*—i.e., based on the location of the visitor to a publisher’s website.”).

⁵³⁹ Lee Initial Report, ¶¶ 486–489.

⁵⁴⁰ See, e.g., Israel Report, Figure 57, in which Dr. Israel presents shares of DFP impressions served to US and non-US users, identifying US impressions from AdX based on user location and US impressions from Google Ads based on advertiser location.

scale generates more data which improves ad tech product quality.⁵⁴¹ The competitive strength in the United States of a firm with a 30% US share but *de minimis* worldwide share would be very different than a firm with a 30% US share and 40% of the worldwide share.

- (351) Additionally, the main participants in the three relevant product markets operate worldwide, not just in the United States. Customers on both sides of the market, advertisers and publishers, operate across national boundaries.⁵⁴² Dr. Israel points to variations in market shares across particular countries as reasons why each country should be analyzed separately, but doing so again overlooks similarities in the competitive landscape across countries in the relevant product markets.
- (352) For example, focusing on ad exchanges transacting indirect open-web display impressions, the set of top exchanges and AdX's high market share among them are similar across countries. Figure 22 below shows the DV360 spending shares of the top 10 US exchanges across the five countries with the highest total spending on DV360.⁵⁴³ These 10 exchanges represented about 90% of indirect open-web display spending on DV360 across each of these five countries. AdX had the highest share of spending on DV360 by a large margin across all five countries, representing between 48% and 56% of spending.

⁵⁴¹ Lee Initial Report, §§ III.D.2 and III.D.3.

⁵⁴² Lee Initial Report, ¶ 5 and Figure 40.

⁵⁴³ "Top 10 US exchanges" is defined as the 10 exchanges with the highest spending on indirect open-web display transactions served to users in the United States within DV360 data.

Figure 22. Ad exchanges with the highest DV360 spend, by user location (2022)

Exchange	United States		United Kingdom		Canada		Germany		Australia	
	Share of DV360 spending	Rank	Share of DV360 spending	Rank	Share of DV360 spending	Rank	Share of spending	Rank	Share of spending	Rank
AdX	48%	1	51%	1	54%	1	53%	1	56%	1
██████	9%	2	5%	6	5%	5	4%	7	3%	8
██████	8%	3	6%	4	7%	3	6%	3	7%	2
██████	6%	4	6%	3	7%	2	9%	2	6%	4
██████	4%	5	4%	7	3%	6	4%	6	7%	3
██████	4%	6	5%	5	6%	4	4%	5	5%	6
██████	3%	7	2%	12	3%	8	1%	15	3%	9
██████	3%	8	2%	9	1%	11	1%	14	3%	7
██████	3%	9	8%	2	2%	9	5%	4	5%	5
██████	2%	10	3%	8	2%	10	2%	10	2%	10
Total	90%		93%		92%		89%		96%	

Source: DV360 data (DOJ RFP 7).

Notes: The table presents shares of indirect open-web display spending in the five countries (by user location) with the highest total indirect open-web display spending on DV360 in 2022. Exchanges are ranked by their share of indirect open-web display spending within each country. The exchanges listed are the top ten in the United States.

██████ provides an infrastructure that allows DSPs to connect with multiple small exchanges simultaneously. Thus, ██████ share of DV360 spending likely represents an aggregation of several smaller ad exchanges. See ██████

- (353) Likewise, focusing on advertiser ad networks transacting indirect open-web display impressions, Google Ads' share of spending on AdX relative to ██████ is similar across countries. Figure 23 below shows the relative shares of Google Ads and ██████ spending on AdX across the five countries – by publisher location – with the highest total indirect open-web display spending on AdX. Google Ads' share of AdX spending relative to ██████ was 92% or higher across all five countries in 2022.

Figure 23. Advertiser ad networks with the highest AdX spend, by publisher location (2022)

Ad network	Share of AdX spending				
	United States	United Kingdom	Germany	Japan	Israel
Google Ads	96%	95%	92%	94%	98%
██████	4%	5%	8%	6%	2%

Source: Google AdX data (DOJ RFP 53).

Notes: The table presents relative shares of indirect open-web display spending in the five countries (by publisher location) with the highest total indirect open-web display spending on AdX in 2022.

- (354) Indeed, it is often the case that there is some variation in competitive conditions across countries or smaller regions impacted by a firm's scrutinized conduct. Yet when the conduct at issue spans regions, and when competition in regions is connected through economies of scale and scope or through customers that operate across regions, evaluating market power across regions or globally

can lead to a better understanding of the overall competitive effects of that conduct. In this matter, for the relevant product markets at issue, all of these conditions hold. US customers are impacted not just directly by Google's conduct in the United States but also indirectly by Google's conduct worldwide, which impacts the competitive options available to US customers through the channels described above.

- (355) An example of this approach can be seen in the US government's 1998 case against Microsoft. In that case, the government alleged that Microsoft had engaged in anticompetitive conduct to protect its worldwide operating system monopoly, using a series of exclusionary contracts with computer OEMs and Internet service providers (ISPs) to stifle competition.⁵⁴⁴ Though the details of the contracts, the legal and regulatory regime, and the competitive landscape likely varied across countries, the Plaintiffs argued that these contracts were all part of a strategy to limit competition in a worldwide geographic market.⁵⁴⁵ The Court accepted a worldwide relevant geographic market.⁵⁴⁶

IV.F.2. My conclusions do not change whether the product markets are analyzed on a worldwide or US

- (356) None of my conclusions change whether the relevant product markets are found to be worldwide of US markets. The challenged conduct is the same within both geographies, and the sources of Google's market power are essentially the same within both geographies. Though there are some differences in market shares depending on the geographic region and the data used, these differences

⁵⁴⁴ Complaint, *U.S. v. Microsoft Corp.*, Civil Action No. 98-1232 (D.D.C. May 18, 1998), ¶ 5, <https://www.justice.gov/atr/complaint-us-v-microsoft-corp>. ("To protect its valuable Windows monopoly against such potential competitive threats, and to extend its operating system monopoly into other software markets, Microsoft has engaged in a series of anticompetitive activities. Microsoft's conduct includes agreements tying other Microsoft software products to Microsoft's Windows operating system; exclusionary agreements precluding companies from distributing, promoting, buying, or using products of Microsoft's software competitors or potential competitors; and exclusionary agreements restricting the right of companies to provide services or resources to Microsoft's software competitors or potential competitors.").

⁵⁴⁵ Complaint, *U.S. v. Microsoft Corp.*, Civil Action No. 98-1232 (D.D.C. May 18, 1998), ¶ 54 ("the geographic market for PC operating systems is worldwide."). See also, *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9 (D.D.C. 1999), ¶ 18 ("Currently there are no products, nor are there likely to be any in the near future, that a significant percentage of consumers world-wide could substitute for Intel-compatible PC operating systems without incurring substantial costs. Furthermore, no firm that does not currently market Intel-compatible PC operating systems could start doing so in a way that would, within a reasonably short period of time, present a significant percentage of consumers with a viable alternative to existing Intel-compatible PC operating systems. It follows that, if one firm controlled the licensing of all Intel-compatible PC operating systems world-wide, it could set the price of a license substantially above that which would be charged in a competitive market and leave the price there for a significant period of time without losing so many customers as to make the action unprofitable. Therefore, in determining the level of Microsoft's market power, the relevant market is the licensing of all Intel-compatible PC operating systems world-wide.").

⁵⁴⁶ *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9 (D.D.C. 1999), ¶ 18 ("Therefore, in determining the level of Microsoft's market power, the relevant market is the licensing of all Intel-compatible PC operating systems world-wide."). See also, *United States v. Microsoft Corp.*, 253 F.3d 34 (D.C. Cir. 2001) (Noting that "[i]n this case, the District Court defined the market as 'the licensing of all Intel-compatible PC operating systems worldwide,' finding that there are 'currently no products--and ... there are not likely to be any in the near future--that a significant percentage of computer users worldwide could substitute for [these operating systems] without incurring substantial costs.'" and subsequently, that "[a] remand on market definition is unnecessary...").

- (456) In Section VIII.A.2 of his report, Dr. Israel presents a series of figures that compare ad exchange, advertiser ad network, and DSP fees. In this section and in Section V.D.2, I show how Israel's analyses are misleading, and when appropriately presented, are consistent with the evidence of Google's ability to charge supracompetitive prices that I present here and in my initial report. In this section, I address Israel's Figures 75 and 76.⁷²¹

V.C.2.a. Dr. Israel's comparisons of AdX's take rate to other exchanges are misleading

- (457) Figure 75 in Dr. Israel's report compares average ad exchange take rates for 2020–2022. This figure “include[s] all transaction types and ad formats.” Dr. Israel includes in his backup, but does not present, a different version of this figure, which contains “estimates limited to indirect web non-video impressions where available.”⁷²²
- (458) Relying on these figures, Dr. Israel claims that Google's fees are not systematically higher than competitors' fees. However, the figure in Dr. Israel's backup that is limited to “indirect web non-video” impressions looks very different than Figure 75.
- (459) In the version limited to indirect web non-video impressions, AdX's take rates are higher than every other exchange pictured except for ██████████, which had a 2% US impression share in 2022.⁷²³ See Figure 29.

this is compositional and driven by transactions outside of the relevant market. (“Non-Open Auction transactions grew from 11 percent of gross revenue in 2014 to 25 percent of gross revenue in 2022.”). These “Non-Open Auction” transactions include Preferred Deal and Programmatic Guaranteed transactions which have a lower AdX take rate. *See also*, Lee Initial Report, ¶ 139, citing GOOG-AT-MDL-006217592, 10/31/2022, at -289 (Google's response to the European Commission, stating “Google's standard revenue share rate for Open Auction and Private Auction transactions is 20%, and Google's standard rate for Preferred Deal and Programmatic Guaranteed is 10%.”).

⁷²¹ In Section V.D, I address Figure 74 in which Israel presents fees for advertiser ad networks and DSPs, as well as the portion of Figure 77 that contains advertiser ad network fees.

⁷²² Israel Report, n. 778.

⁷²³ Although ██████████ has higher fees than AdX on indirect non-video impressions, ██████████ also has a 1% share worldwide, in contrast to AdX's 57% share. ██████████ higher fees and much, much lower share do not change my conclusion about Google's market power in the ad exchange market. A niche rival can have higher fees than a firm with monopoly power if that niche firms is differentiated and sells to a small set of customers. For example, a hypothetical monopolist of all cars that are currently sold for less than \$100,000 would likely possess substantial market power, even if on average its prices were much lower than a small firm in that market that sold only \$90,000 cars.

There is evidence that ██████████ is differentiated from other ad exchanges. *See, e.g.*, GOOG-TEX-00124296, at-504 Google's 2017 DVAA Strategy Book includes a “Competitive / Ecosystem Analysis” section. Under this heading includes ██████████ and “Other exchanges” ██████████. A separate “Point players” list reads ██████████ etc; *See also* GOOG-TEX-00106945, at -991, 2018 Meeting notes which include “... ██████████ (Native focused but buys all inventory).” During 2020–2022, the weighted average CPM of a ██████████ transaction (\$2.33) was approximately twice as high as that of other exchanges (\$1.01) in Israel Figure 75 combined. The worldwide weighted average CPM of transactions on ██████████ is higher than that of 9 of the 10 exchanges in Dr. Israel's Figure 75: ██████████, and Google AdX (\$0.88). ██████████; its share of impressions was 1% in 2022 (Lee Initial Report, Figure 110).

It is important to recognize that AdX transacts *far more* impressions than other ad exchanges, and faces less competition

revenue. The comparison of Google Ads' take rate to the Criteo-3PE take rate is an inapt comparison, however. Dr. Israel's analysis overlooks and does not account for Criteo's focus on high CPM impressions like retargeting, whereas Google Ads targets a wider range of impressions.⁷⁵⁵

Figure 32. Worldwide average advertiser ad network indirect open-web display fees (2018–2022)

Ad network	Inventory source	Fees (% of gross revenue)
Google Ads	AdX	13%
	AdSense	32%
	Third-party exchanges	31%
[REDACTED]	[REDACTED]	29%
	Third-party exchanges	43%
[REDACTED]		25%

Source: Google Ads data (DOJ RFP 7, 54); [REDACTED]

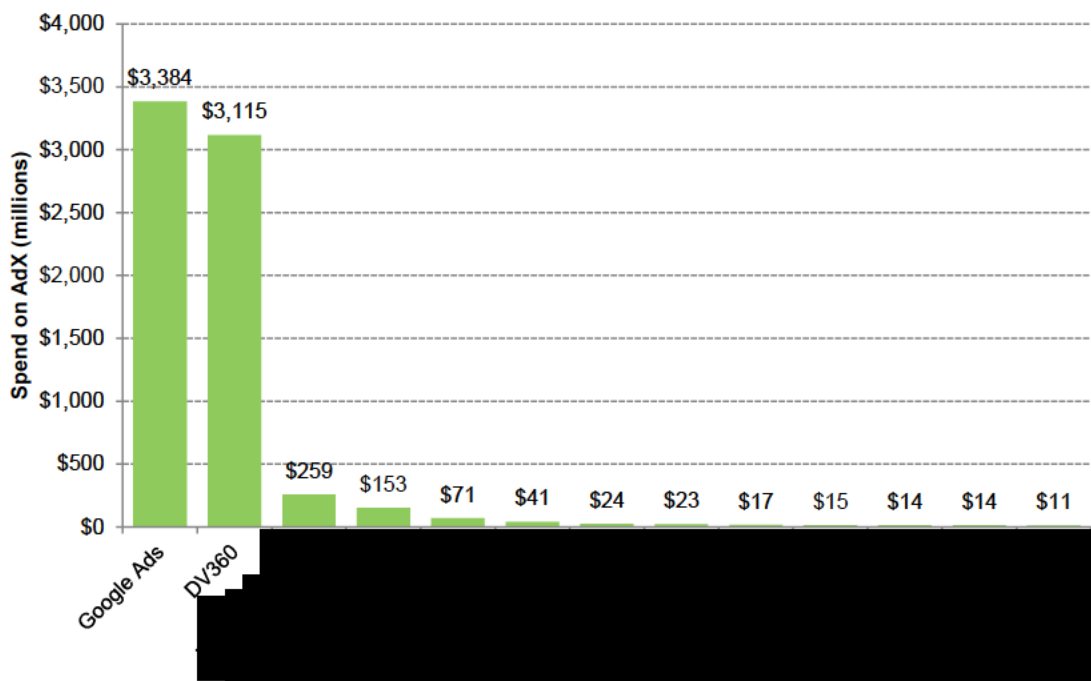
Note: The table reflects fees taken by Google, [REDACTED] on indirect open-web display transactions. For Google Ads-AdX transactions, the table reflects the buy-side fees collected by Google. Google aggregates buy-side and sell-side fees for transactions through [REDACTED], so fees collected by Google on Google Ads-[REDACTED] transactions reflect a reported 32% take rate. The figure excludes transactions from Google Ads and [REDACTED] where it is not possible to identify the inventory source and Google Ads transactions through Demand Product. These transactions account for a small share of spending through Google Ads or [REDACTED]. See Figure 33 below. [REDACTED]. The figure includes worldwide transactions; I include a version limited to the United States in Appendix B.

- (492) Third, Dr. Israel's analysis ignores differences in the volume of commerce transacted by Google and its competitors, thus overstating the competitive significance of third-party ad networks. Figure 33 contains the total net and gross revenues transacted by Google Ads, FAN, and Criteo between 2018 and 2022. Figure 33 shows that Google Ads transacted over 5 times the amount of gross revenue as Criteo during this period. Thus, Criteo likely does not impose a significant constraint on Google's substantial market power in the advertiser ad network market.

⁷⁵⁵ See, e.g., GOOG-TEX-00124296, at -421 (08/22/2016) (2017 DVAA Strategy Book, including description of "players" in the retail vertical like "long-time remarketer Criteo."); see also, GOOG-AT-MDL-007387750 at -753 (10/28/2016) ("DFL is growing fast for Criteo & smaller buyers" in the category of "Remarketing/Big Buyer" header bidding transactions); see also, GOOG-AT-MDL-013133578, at -602 (06/09/2023) ("High CPM, low fill demand (e.g. remarketing by Criteo and Amazon) is able to compete against the vast majority of standard direct and indirect impressions") (for the indirect open-web display impressions that Criteo won worldwide during 2020–2022, the average CPM is \$1.24. For the indirect open-web display impressions that Google Ads won on AdX the average CPM is \$0.79. For the indirect open-web display impressions that Google Ads won on third-party exchanges via AWbid (which also focuses on retargeting impressions), the average CPM is \$1.57).

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Figure 89. Scale of Google Ads and DV360 in comparison to that of non-Google advertiser bidding tools, measured by spending on AdX, worldwide (2022), extension of Israel Report, Table 16, left panel

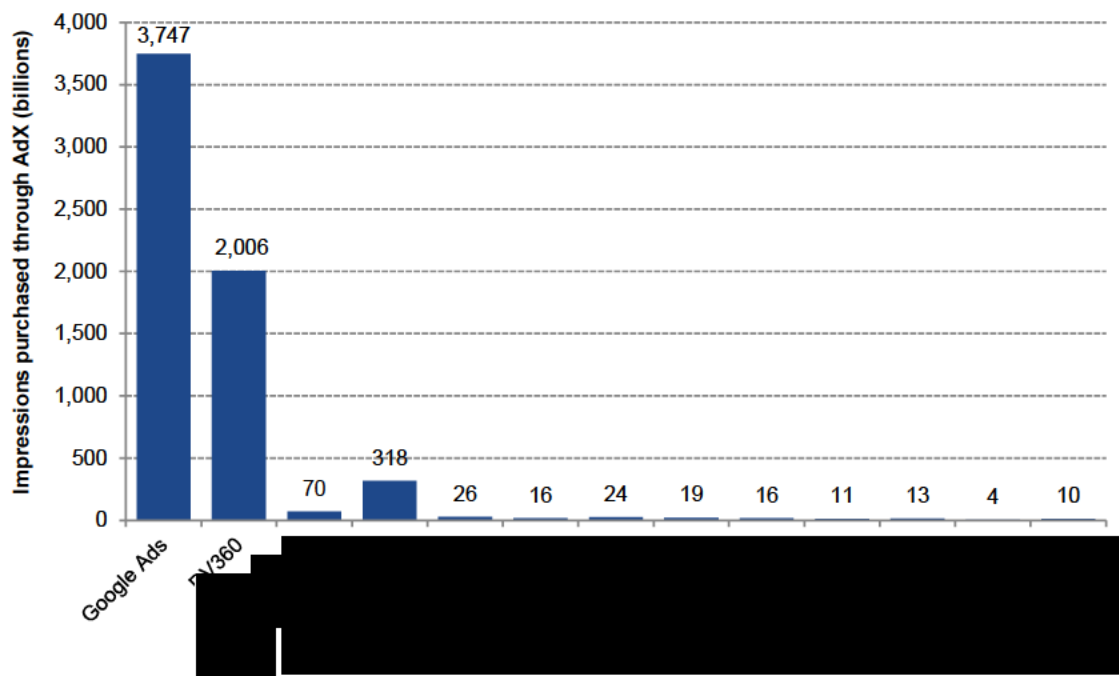


Source: Google AdX/Open Bidding data (DOJ RFP 7).

Note: Dr. Israel's data lists DV360 as an exchange, but it has been re-classified as a bidding tool for the purposes of this analysis. Unlike Israel Table 16, this figure includes all worldwide spend.

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Figure 90. Scale of Google Ads and DV360 in comparison to that of non-Google advertiser bidding tools, measured by impressions purchased on AdX, worldwide (2022), extension of Israel Report, Table 16, left panel

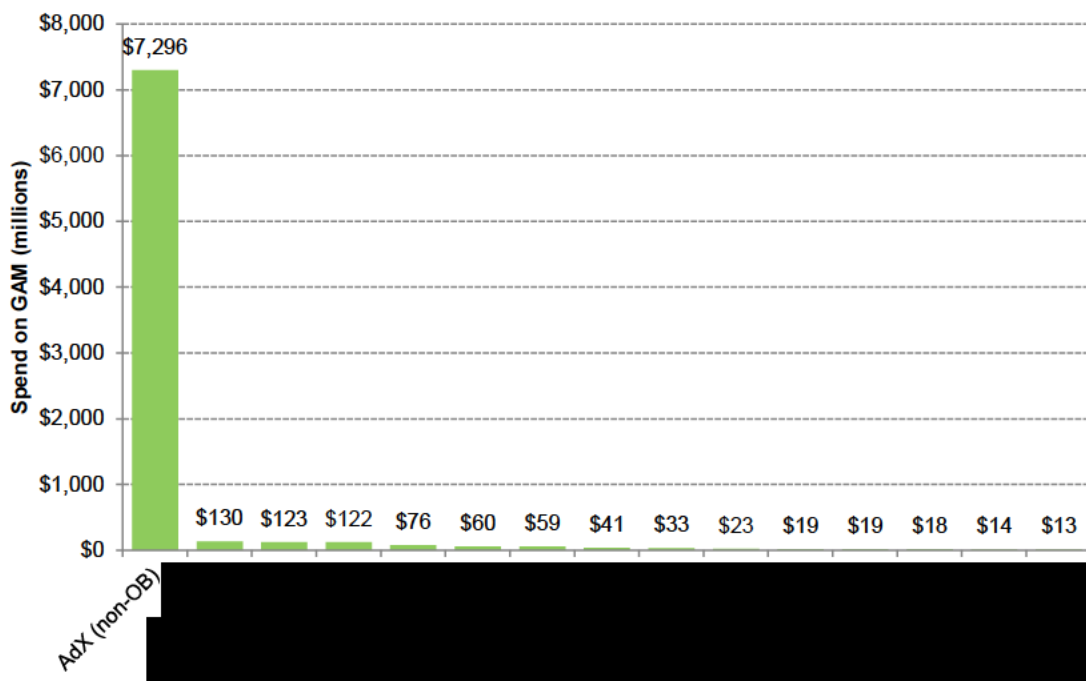


Source: Google AdX/Open Bidding data (DOJ RFP 7).

Note: Dr. Israel's data lists DV360 as an exchange, but it has been re-classified as a bidding tool for the purposes of this analysis. Unlike Israel Table 16, this figure includes all worldwide impressions.

Expert Rebuttal Report of Robin S. Lee, PhD

Figure 91. Scale of AdX in comparison to that of non-Google exchanges participating in open bidding, measured by spending on GAM, worldwide (2022), extension of Israel Report, Table 16, right panel




Source: Google AdX/Open Bidding data (DOJ RFP 7).

Note: "AdX (non-OB)" in this figure consists of all the spending from non-Google authorized advertiser bidding tools in Israel's data, as well as Google Ads and DV360. Unlike Israel Table 16, this figure includes all worldwide spend.

Errata for the February 13, 2024 Expert Rebuttal Report of Robin S. Lee, PhD

Location	Original Text	Corrected Text
Paragraph 35	In this matter, the strength and importance of indirect effects for customer decisions will tend to vary across ad tech products <i>and</i> by direction	In this matter, the strength and importance of indirect network effects for customer decisions will tend to vary across ad tech products <i>and</i> by direction
Paragraph 165	Last, Dr. Israel again points to purported “multi-homing” and “substitution” statistics in Prof. Simonson’s survey, but again neither support his assertion that advertisers view app inventory as a close substitute for web inventory	Last, Dr. Israel again points to purported “multi-homing” and “substitution” statistics in Prof. Simonson’s survey, but again neither support his assertion that advertisers view instream video inventory as a close substitute for web inventory
Paragraph 176	With respect to the first point, as I explained above in Section IV.A.3, simply using two different sales channels does not equate to close substitution between them	With respect to the first point, as I explained above in Section IV.A.4, simply using two different sales channels does not equate to close substitution between them
Paragraph 257	Paragraph 257 is formatted as a paragraph.	For clarity, Paragraph 257 is a block quote from the document cited in footnote 417. For convenience, no change is made to the paragraph numbers.
Paragraph 315	Paragraph 315 is formatted as a paragraph.	Paragraph 315 is heading “IV.F” and should read as corrected: “ IV.F Dr. Dr. Israel’s single two-sided market for ad tech tools is not appropriate for evaluating the competitive effects of Google’s conduct in the ad tech stack ” For convenience, no change is made to the paragraph numbers.
Heading IV.E.3	IV.E.3 A single market for all ad tech products obscures rather than illuminates the relevant competition	Heading IV.E.3 should read as corrected: “ IV.F.1 A single market for all ad tech products obscures rather than illuminates the relevant competition”
Heading IV.E.4	IV.E.4 Dr. Israel’s proposed competitive constraints on “individual component markets” within ad tech do not survive scrutiny	Heading IV.E.4 should read as corrected: “ IV.F.2 Dr. Israel’s proposed competitive constraints on “individual component markets” within ad tech do not survive scrutiny”

Heading IV.E.5	IV.E.5 Dr. Ghose’s discussion of “alternative pathways and tools” obscures the central role played by publisher ad servers, ad exchanges, and advertiser ad networks	Heading IV.E.5 should read as corrected: “ IV.F.3 Dr. Ghose’s discussion of “alternative pathways and tools” obscures the central role played by publisher ad servers, ad exchanges, and advertiser ad networks”
Heading IV.F	IV.F Relevant geographic markets for publisher ad servers, ad exchanges, and advertiser ad networks	Heading IV.F should read as corrected: “ IV.G Relevant geographic markets for publisher ad servers, ad exchanges, and advertiser ad networks”
Heading IV.F.1	IV.F.1 Dr. Israel incorrectly dismisses the appropriateness of a worldwide geographic market	Heading IV.F.1 should read as corrected: “ IV.G.1 Dr. Israel incorrectly dismisses the appropriateness of a worldwide geographic market”
Heading IV.F.2	IV.F.2 My conclusions do not change whether the product markets are analyzed on a worldwide or US	Heading IV.F.2 should read as corrected: “ IV.G.2 My conclusions do not change whether the product markets are analyzed on a worldwide or US basis ”
Paragraph 345	Paragraph 345 is formatted as a paragraph.	For clarity, Paragraph 345 is a block quote from the document cited in footnote 532. For convenience, no change is made to the paragraph numbers.
Paragraph 436	When controlling for changes in the composition of publishers over time, DFP fees remained relatively flat between August 2014 and March 2023	When controlling for changes in the composition of publishers over time, DFP fees remained relatively flat between February 2014 and March 2023
Paragraph 493	Paragraph number 493 is formatted as red text.	As corrected, paragraph number 493 is properly formatted as black text.
Appendix A		Appendix A begins with “In addition to the materials listed below, I incorporate by reference all materials cited within the footnotes in this report and in my initial report and the accompanying back up materials.”
Appendix A.4	GOOG-DOJ-AT-00517933	GOOG-DOJ-AT-00571933
Footnote 363	I discuss the flaws with this market below in Section IV.G.	I discuss the flaws with this market below in Section IV.F .
Footnote 1022	GOOG-DOJ-AT-00517933, at -934	GOOG-DOJ-AT-00571933, at -934


Robin S. Lee, PhD

MARCH 8, 2024
Date